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MUNICIPAL CONDITIONS IN HAVANA

What Governor Wood Accomplished in Havana—The City Thoroughly Cleansed—Yellow Fever Stamped Out—Street and Public Buildings Improved—Other Work Projected

By C. E. McDowell

WHEN the Army of Intervention entered the city of Havana in 1898 the streets were so vile the men had to break ranks to avoid pollution. This condition was the result of centuries of Spanish misrule. Martial law was proclaimed and the American soldier became policeman, fireman and soldier, all at the same time.

Havana has 250,000 people and 20,000 houses, of which some 10,000 have water connections. The houses have no cellars, are six inches only above ground, with no ventilation. The majority of houses and homes are simply four walls of stone made of adobe. In this enclosure, around the open patio, you will find not only the family (generally large in number) but also all the domestic animals belonging to them, including the mule, cow, goat, dog, cat and parrot, all harmonious, with stable, kitchen, and dining room contiguous to the cesspool.

There was no ordinance requiring the householder to empty the cesspool. He used it as long as he could, and when cleaned left a track of filth through kitchen, dining room, reception room and hall to the street. For over three hundred years house drainage went into these cesspools, which ranged in size from three to ten feet deep; all open below (no cementing) so they drained off into the soil and rock, infecting everything within reach. This the better class did; the poor used the street as a receptacle for everything, letting the tropical suns and vultures do the rest. Disease ran rampant in consequence. History tells us that from 1800 to 1819, 26,576 died from yellow fever alone; in 1832, 10,000 died from cholera and that up to 1896, 82 per cent. of the deaths in the Spanish army were from yellow fever.

MAJOR-GENERAL LEONARD WOOD

When General Ludlow assumed control the city was reeking in filth. Public buildings had been looted; the people were starving. The Spanish army was sent home and the people fed. Police and fire departments were established. Street cleaning was begun systematically. Sanitary regulations were instituted and enforced and the street refuse carried out to sea. A general clean-up of the city followed. Centuries of Spanish misgovernment could not be overcome quickly, and only a beginning could be made by General Ludlow, who was recalled and sent to the Philippines on a similar errand. General Brooke was recalled to the United States and Major-General Leonard Wood put in command of the island. Fresh from success at Santiago, where he had driven out yellow fever by modern American sanitary methods, he took up the work where General Ludlow left off and carried these, and many other improvements to a finish.

WHAT GENERAL WOOD SOUGHT TO ACCOMPLISH

The things nearest the heart of General Wood were, first, health and all that this implies. This included sanitation, cleaning the streets, po-

licing the city and putting the asylums and hospitals in proper condition for the poor, the sick, and the afflicted. Schools came next, and the results show that he never forgot or neglected the schools.

Havana has one hundred and twenty-five miles of streets, of which about twenty-five miles are paved with granite, Belgian block, asphalt, asphalt block and brick. The balance is largely macadamized. The asphalt, asphalt block and brick were somewhat experimental. Not entirely so as to brick, as the Havana Electric Railway Company, in relaying its tracks, repaved with brick on a concrete base. These were largely furnished by the National Pyrogranite Company of New Jersey.

The old city is very narrow, only twenty-two to thirty feet between the house lines. The old streets are paved with granite and Belgian block, brought from New York, New Jersey, Belgium, France, and Spain. The newer city has wider streets and better conditions. The only natural stone found around Havana is a coral limestone. As the condition of travel was very heavy the material at hand was found to be very inferior, soon grinding to powder and washing or blowing away. General Wood sought a better material. Being familiar with the New Jersey and Hudson River trap rocks, his thoughts turned that way. They were found too expensive at first and experts were sent out to find a hard rock near by. The writer, at the request of General Wood, found a high-grade, hard limestone at Mariel, some fifteen miles from Havana, where it had been used with great success for many years on the main highway going into the Province of Pinar del Rio. The cost of transportation, however, precluded the use of it in Havana. About this time the writer submitted to him a sample of syenite or bastard granite, found at Campo Florida, some twenty miles from Havana, towards Matanzas, in an abandoned asphalt mine. Good rock was found in large quantities. The quarry was opened and equipped with steam drills and a three hundred-ton per day capacity Farrel-Bacon stone crushing plant by the Cuba Supply Company. This company furnished up to July 1, 1902, some 25,000 tons of material in the improvements made in the city. In addition, a company, known as the Cuba Quarry Company, owning the San Miguel quarry, near Havana, furnished thousands of tons of crushed lime-stone, used in all the Telford bottom and concrete curbs and walks, of which many miles were laid. It was also used for the new sea walls along the harbor and the coast. While these quarries were running to their limit, they did not give the quantity needed for the work laid out, and so some 25,000 tons of trap rock, from Shady Side, N. J., and Rockland Lake, N. Y., were brought down. It is estimated that 60,000 tons of stone alone were used in the improvements made in the year ending July 1, 1902.

Conditions Before and After American Intervention

The condition of the streets before and after improvement, is shown in some of the sketches accompanying this article. During the last years of the Spanish occupation the streets were entirely neglected. When the Army of Intervention came the streets that had been macadamized were worn out, full of holes and depressions, being open cesspools with stagnant water standing in them months at a time. This needed quick and heroic treatment, and this it had to the end of our occupation. The expenditure for this work alone amounted to a million dollars. From impassable streets to modern boulevards is a strong contrast. Where formerly were marshes, waste places, and dumping grounds, are now beautiful parks and driveways, carefully laid out and executed by American engineers and native help. Of the many driveways reaching out into the country that were improved or built, I fain would write, but space will not permit. I can only refer to a few important improvements made. The com-

VAPOR STREET, HAVANA, IN JANUARY, 1900

AGUILA STREET, HAVANA, 1900

ESCOBAR STREET, 1899

VAPOR STREET, HAVANA, IN JUNE, 1900

AGUILA STREET, HAVANA, 1901

ESCOBAR STREET, 1901

ing of the late Col. George E. Waring, Jr., the Street Commissioner of New York, revolutionized the methods then in vogue. This visit cost him his life, but left a monument to his memory, for Havana was made and kept as clean as New York, although hampered by bad pavements and cramped conditions.

All the sewers in Havana have the coral rock for a bottom and blue stone slabs for sides and tops; there were some 3,000 buildings put in order by the sanitary department, which aided in stamping out yellow fever. This required the expenditure of vast sums of money, both for overhauling and maintenance.

Los Animus Hospital was the yellow fever hospital under direct charge of the American Army Surgeon. Here were made the tests that proved the mosquito to be the main cause of extending yellow fever. The result of these tests and the order to close all open wells and disinfect every stream, ditch, and low spot, where water stagnated, made Havana a healthy city. This required the expenditure of a large sum of money, but the results attained gratified the American people.

The various public buildings were, in many respects, in a wretched condition. Hospitals and asylums were these in name only. The conveniences were few and very inferior. Without a single exception, they were overhauled at an expense aggregating hundreds of thousands of dollars. The prisons of Havana, previous to the coming of the Army of Intervention, were in a most lamentable condition. He was indeed most unfortunate who fell into the hands of the police. The unwritten Spanish law makes a man guilty by his arrest, for the King (police) can do no wrong. As all of the improvements made came under my own eye, I can vouch for the wretched condition prevailing. It beggars description. By order of General Wood, all of these buildings were overhauled, made sanitary and a prisoner treated like a human being. To-day the prisons will compare favorably with those of our own country.

The first palace was the home of the Governor-General. Before General Brooke could live in it, some fifty big cart loads of dirt were taken away, and the building had to be thoroughly renovated and fitted with modern American plumbing appliances before it became habitable. This might be said, also, of the second palace in which the Spanish officers lived. To-day, with their marble and tiled floors, marble stairways and balustrades, they present a handsome and comfortable appearance.

The Hospital Militar was the military hospital for over a century. When the Army of Intervention arrived, it was a wreck. It had been looted by the Spaniards of everything that could be carried away. It had a known death record of 20,000 deaths from yellow fever alone, and many thousands more from other diseases. This was put in a state of perfect repair at a cost of $150,000 and so thoroughly rebuilt that it will stand a century longer. The lower floors are user as warehouses and the upper floor for the high school of Havana, with a daily attendance of 800 to 1,000 scholars.

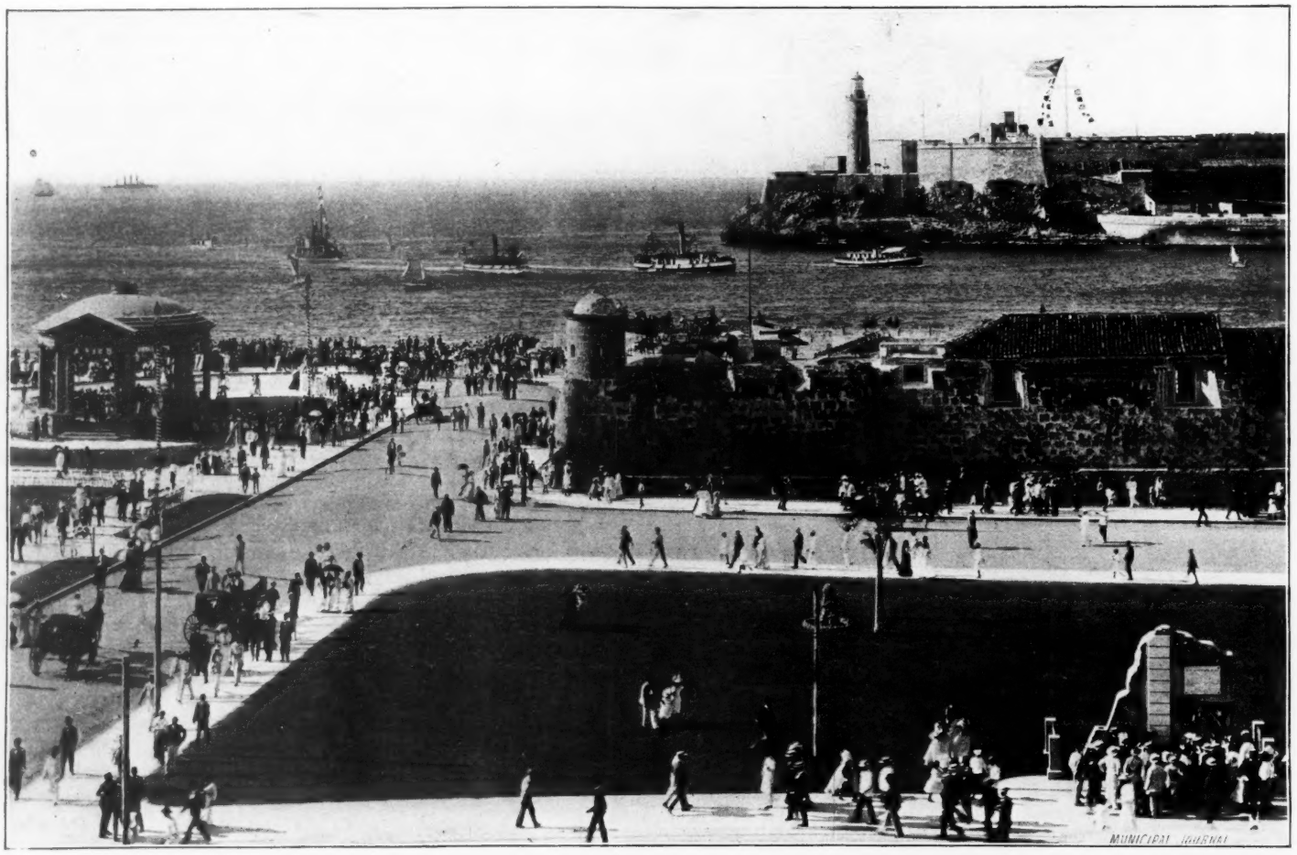
Situated on one of the highest points in Havana, directly in front of the principle Castle, is the Pyrotechnia Militar, or Military Institute, the West Point of Cuba. Here the young Spanish officers were taught the arts of war. Here was the arsenal and here was the ammunition made. When the Spaniards left they took everything from here but the boiler and the engine, and the place was a wreck. Orders were given to improve this building for the use of the College of Havana. This was done at an expense of over $100,000, and the money was well spent.

Governor Wood Says "Good Bye"

Our large sketch is taken at the Punta in Havana about 4 P. M., May 20, 1902. In the distance is seen the U. S. steamer Brooklyn, heading northwest with General Wood

and staff on board. In the left foreground is seen the new band stand. In the centre is old Punta Fort, with its antiquated bronze guns. On the right is seen part of the old wall with its tablet commemorating the spot where Cuban students were shot for desecrating the grave of General Castanon, a Spaniard, buried in Havana, a charge which was afterwards proven false. All around are the improvements made in the latter days of the occupation by the United States, representing an expenditure of hundreds of thousands of dollars. Their completion makes this one of the handsomest spots in America. Cement curbs and sidewalks, fine macadam roads, and parks full of bright foliaged plants, and flowers, make this an ideal resting place.

One of our sketches shows a new band stand erected at the foot of the Prado, at a cost of $4,000. This is built entirely of concrete, with twisted steel rods inserted during the construction, under the Ransome system. The effect of this class of work is to lighten the walls in thickness and yet give it the same strength. It occupies one of the most prominent places in Havana, is a success in acoustic qualities, and should last forever. This stand is erected on the spot that was formerly the largest dumping ground in Havana. All around it are completed improvements, to which the building is a climax. It is at the end of the Prado, the great promenade of Havana. At this point thousands gather three times a week to hear the concerts given there, to the enjoyment of all.



ENTRANCE TO HAVANA HARBOR—MORO IN THE DISTANCE, WITH PUNTA FORT IN FRONT—NEW BAND STAND AT THE LEFT—STUDENTS' MEMORIAL IN RIGHT FOREGROUND

On May 20, 1902, General Wood, under instructions from President Roosevelt, promulgated a proclamation, at the same time relinquishing the control of the island. Among other things (said this proclamation) the new government was to assume were, "The plans already devised for the sanitation of the cities of the island, and to prevent a recurrence of epidemic and infectious diseases.

"A plan for the sewering and paving of the city of Havana, for which a contract has already been awarded by the municipality. "The sanitary rules and regulations in force in the city of Havana."

President Palma accepted these obligations, among others, in his reply, and said it became his duty to maintain the high character of the work already done.

Much Remains to Be Done

The island has passed through a season without yellow fever or smallpox. This shows that the system laid down by General Wood, and those who preceded him, were wise and timely. That this may continue for all time, it is essential that the contract for sewering and paving of Havana be carried out. This contract is very complete in all its detail, is very comprehensive in character, and very expensive, representing a cost of $11,000,000. This contract was entered into by the contracting parties a year ago, but nothing yet has been done with it. It is announced that work will begin soon. This work includes the following improvements: 170 miles of sewers, sewerage and storm water—the demand on the latter is very heavy for five months of the year. These sewers range from 8 inches to 14 feet in diameter.

There will be 2,400 receiving inlets; 35 miles of sewer ventilators; 80 miles of vitrified pipes for house connections to sewers; 35 miles of iron pipes for house connections to sewers; 4 miles of house connections to drains; 8 miles of inlet connections to drains; a sewer tunnel 2,100 feet long and seven feet in diameter; a drain tunnel 1,300 feet long and 7 feet in diameter. Siphons, pumping stations, settling basins, etc., etc., in great numbers.

Paving construction will require,—

Excavation, preparing sub grade	366,000 cubic yards
Broken stone fill, sub grade	13,000 cubic yards
Rolling, sub grade	1,116,000 square yards
Foundation concrete	121,500 cubic yards
Brick pavements	643,200 square yards

Sheet asphalt, including brick gutters
Asphalt block, including brick gutters ..... 474,600 square yards.
Standard granite curbing on sand bed
Standard granite curbing on concrete bed
Blue stone curbing on sand bed .... 693,000 lineal feet.
Blue stone curbing on concrete bed
Special 8x8 granite curbing
Circular curbing of above classes..... 15,300 lineal feet.
Resetting old curbing ..... 165,000 lineal feet.

To complete this contract will take four or five years. When finished and cared for properly it should free Havana from any epidemic of disease forever.

While there yet remain many improvements to be made, the Havana of to-day would hardly be recognized as that of ten years ago, as it existed under Spanish rule. The contrast between the two conditions almost beggars description. In the old days sanitation was unknown, the streets were filthy and out of repair, there was no sewer system, the water works were in a disgraceful condition and there was no real effort made to keep the supply pure, public buildings were in a dilapitated and filthy condition; in fact, the situation presented an aspect of universal squalor which was not altogether confined to the poorer sections of the city. It is not surprising, therefore, that these wretched conditions brought forth disease and pestilence, poverty and despair, death and destruction both to the material and moral forces combined in civilization.

Out of the Spanish War and as a result of the temporary American occupancy, the whole scene has been changed. The city has been beautified and thoroughly cleansed, from palace to hovel, and in the upper and nether regions of society. Besides all this, a system of government has been created and the modern civic functions well defined. Every department was reorganized and placed on an equal footing, so far as administrative methods and equipment were concerned, with the most progressive city in the United States of the same class. This work included the financial, engineering, sanitation, street cleaning, garbage collection and disposal, fire protection, police protection, parks, and every other function of a well-ordered municipal government. Such was the civic machine turned over to the Cubans when General Wood departed for the North on that memorable day last May.

All this has necessarily had a beneficent effect upon the life of the people. The various classes of society, particularly the poorer element, have been greatly benefitted by the changed conditions. In multitudes of cases life has become something more than a mere existence. The Cubans have been quick to learn and to imbibe American notions and practices. It is not at all likely that there will not be disturbances and somewhat of a retrogression under Cuban rule. This must be expected. The bad influences of the misrule of previous centuries cannot be dissipated in four short years, be the reform ever so thorough and complete for that period. Nevertheless, the upward tendency given to Havana affairs will not be stopped. The industrial, economic, social and civic conditions of the Cuban metropolis will continue to improve, though perhaps not at the pace maintained under American intervention. It may safely be predicted that the commonest and most imperative requirements of a city government will never again be abandoned in this city, such as to cleaning the streets, rescue the dying or even bury the dead. The outlook for the future is exceedingly bright.

NEW BAND STAND—BUILT OF CONCRETE, REINFORCED BY TWISTED STEEL

The author is indebted to John Kendrick Bangs, the writer, and the Betts Publishing Company, Publishers of "Uncle Sam, Trustee," for the use of many half tone cuts in this article.

COMMON SENSE IN LIBRARY BUILDING

Adaptation as to Size and Location Essential—Art Metal Construction for Stack Room, Shelving, Etc.—Consideration of Important Features

*By W. R. Eastman**

A building is not the first requisite of a public library. A good collection of books, with a capable librarian, will be of great service in a hired room, or in one corner of a store. First the librarian, then the books and after that the building.

But when the building is occupied the value of the library is doubled. The item of rent is dropped. The library is no longer dependent on the favor of some other institution, and is not cramped by the effort to include two or three departments in a single room. It will not only give far better service to the community, but will command their respect, interest and support to a greater degree than before.

General Suggestions

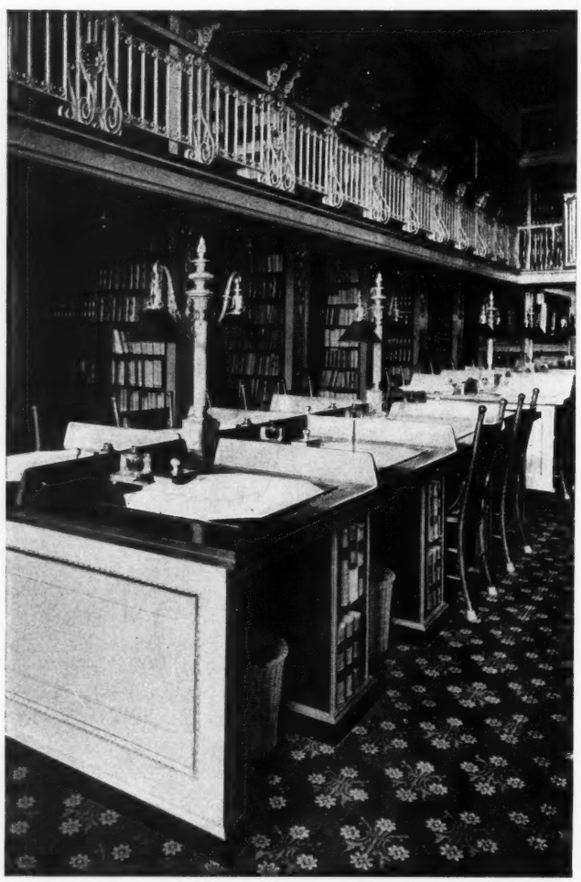
The following hints are intended as a reply to many library boards who are asking for building plans.

The vital point in successful building is to group all the parts of a modern library in their true relations.

In a popular library, outside the reference room, for each foot of wall space available eighty books can be placed on eight shelves. Floor cases having two sides will hold 160 books for each running foot, and in a close stack twenty-five books, approximately can be shelved for each square foot of floor space. But the latter rule will be materially modified by ledges, varying width of passages, stairs, etc.

The above figures give full capacity. In practical work to provide for convenient classification, expansion, oversized books and working facilities, the shelves of a library should be sufficient for twice the actual number of books, and the lines of future enlargement should be fully determined.

By careful study the building committee is prepared to draw an outline sketch indicating in a general way their needs and views. They are not likely to secure what they want by copying or even by competition. The best architects have not the time nor the disposition to compete with each other. A better way is to choose an architect, one who has succeeded in library work, if possible, who will faithfully study the special problems, consult freely with the library board, propose plans and change them freely till they are right. And if such plans are also submitted for revision to some librarian of experience, or to the library commission of the state, whose business and pleasure it is to give disinterested advice, so much the better.



LIBRARY FURNISHINGS IN PHILADELPHIA CITY HALL

Library for a Country Neighborhood

The following outlines taken from actual library buildings are offered by way of suggestion:

An inexpensive building for a small country neighborhood may have one square room with book shelves on the side and rear walls. A convenient entrance is from a square porch on one side of the front corner, and a librarian's alcove is at the opposite corner, leaving the entire front like a store window, which may be filled with plants or picture bulletins. With a stone foundation the wooden frame may be finished with stained shingles.

A somewhat larger building may have a wider front, with entrance at the center.

Book shelves under high windows may cover the side and rear walls, and tables may stand in the open space.

It will be convenient to bring together the books most in demand for circulation on one side of the room, and those needed most for study on the opposite side. One corner may contain juvenile books. In this way confusion between readers, borrowers, and children will be avoided. Each class of patrons will go by a direct line to its own quarter. This is the beginning of the plan of departments which will be of great importance in the larger building.

The number of books for circulation will increase rapidly, and it may soon be necessary to provide double-faced floor cases. These will be placed with passages running from the center of the room toward the end, and that end will become the book or delivery room, and the opposite side will be the study or reference room.

The next step is to add space to the rear, giving a third department to the still open room. If the bookroom is at the back the student readers may be at tables in the right-hand space, and the children in the space on the left. The librarian at a desk in the center is equally near to all departments, and may exercise full supervision.

The presence of a considerable number of other busy persons has a sobering and quieting effect on all, and the impression of such a library having all its departments in one is dignified and wholesome. It may be well to separate the departments by light, open hand rails, screens, cords or low book cases. It is a mistake to divide a small building into three or four small rooms.

The Larger Library

For a larger library these rails must be made into partitions, giving to each department a separate room. Partitions of glass, set in wooden frames, and possibly only eight feet high, may answer an excellent purpose, adding to the impression of extent, admitting light to the interior of the building, and allowing some supervision from the center. With partitions on each side, the entrance becomes a central hallway, with a department at each side, and the bookroom at the end. This is the best position for the bookroom for two special reasons. Overlapping the departments in both wings it is equally accessible from either, and at the back of the house a plainer

* New York State Library, Albany, N. Y.

and cheaper wall can be built, admitting of easy removal when the growth of the library requires enlargement.

Sometimes the angles between the bookroom and the main building may be filled to advantage by workroom and office. These working-rooms, though not large and not conspicuous, are of vital consequence, and should be carefully planned.

We have now reached a type of building which, for lack of a better word, I may call the "butterfly plan," having two spread wings and a body extending to the back. Others call it the "trefoil." This general type is being substantially followed in most new libraries of modern size. From one entrance hall direct access is given to three distinct departments, or perhaps five, by placing two rooms in each wing.

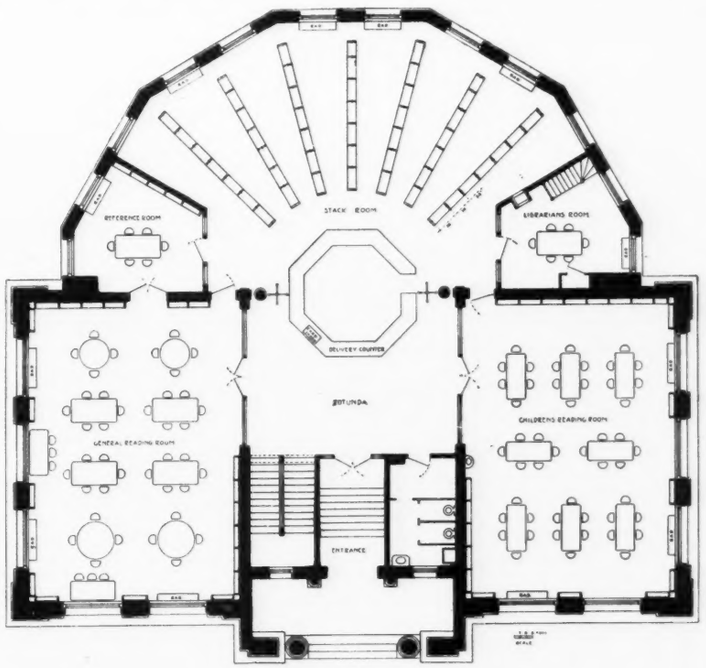
Some Exterior Considerations

If we have an open park to build in we shall be tempted to expand the hallway to a great central court or rotunda. Perhaps the importance of the library may justify it, but we should be on our guard against separating departments by spaces so great as to make supervision difficult, or passing from one to another inconvenient. We should aim to concentrate rather than scatter.

More frequently the lot will be too narrow. We must draw in the wings and make the narrower rooms longer from front to back. With a corner lot we can enter on the side street, leaving a grand reading-room on the main front, and turning at right angles as we enter the house, between other rooms to the bookroom at the extreme end of the lot. Or again, we shall be obliged to dispense entirely with one wing of our plan, and have but two department rooms instead of three on the floor. Every location must be studied by itself.

Basement rooms are of great service for workrooms and storage. A basement directly under the main bookroom is especially valuable to receive the overflow of books not in great demand.

A second and even a third story will be useful for special collections, class and lecture rooms, or for a large audience hall. In the library of moderate size it will often be found convenient to build a bookroom about six feet high to cover two stories of bookcases, and wholly independent of the level of the second floor of the main building.



FIRST FLOOR PLAN OF CARNEGIE LIBRARY, WEST SUPERIOR, WIS.

When to Plan for Extensions

To meet the needs of a rapidly growing library it is important at the beginning to fix the lines of extension.

A building with a front of two rooms, and a passage between, may add a third room at the rear, and at a later stage add a second building as large as the first and parallel to it, the two being connected by the room first added. This is the architect's plan for the Omaha Public Library.

When a library is so large that one bookroom is not enough, two such rooms may be built to the rear, one from each end of the building, with open space between, and these two wings may be carried back equally and joined at the back by another building, thus completing the square around an open court.

This gives wide interior space for light and air, or grass and flowers. Such is the plan of the Boston Public and Princeton University libraries. It will be the same in Minneapolis when that library is complete. In the plan of the new library at Newark, New Jersey, the central court is roofed over with glass, becoming a stairway court, with surrounding galleries opening on all rooms. In Columbia University, New York, as in the British Museum, the center is a great reading-room, capped by a dome high above the surrounding roofs, and lighted by great clerestory windows.

If the street front is very long there may be three extensions to the rear, one opposite the center and one from each end, leaving two open courts, as in the plan for the New York Public or the Utica Public; and this general scheme may be repeated and carried still farther back, leaving four open courts, as in the Library of Congress. This plan can be extended as far as space can be provided.

When the general plan of the large building is fixed, passages will be introduced, parallel to the front and sides, and departments will be located as may be judged most convenient, always having regard to the convenience of the patrons of each department in finding ready access to the books they need, and providing for supervision and attendance at least cost of time, effort and money. Extravagance in library building is not so often found in lavish ornament as in that unfortunate arrangement of departments which requires three attendants to do the work of one or two.

The Question of Light

Natural light should be secured if possible for every room. Windows should be frequent and extend well up toward the ceiling, terminating in a straight line, so as to afford large supply of light from the top. Windows like those in an ordinary house or office building, coming within two or three feet of the floor, are more satisfactory, both for inside and outside appearance, than those which leave a high blank wall beneath them. From the street a blank wall has a prisonlike effect; on the inside it cuts off communication with the rest of the world, and the impression is unpleasant. The proper object of library windows six or eight feet above the floor is to allow unbroken wall space for book shelves beneath them. There is no serious objection to this at the back of the room, or sometimes at the sides of the house, where the windows are not conspicuous from the street, but every room of any size, if it is next to the outer wall, should have windows to look out of on at least one side.

A bookroom at the back of a building may secure excellent light from side windows eight feet above the floor, with lower windows at the back.

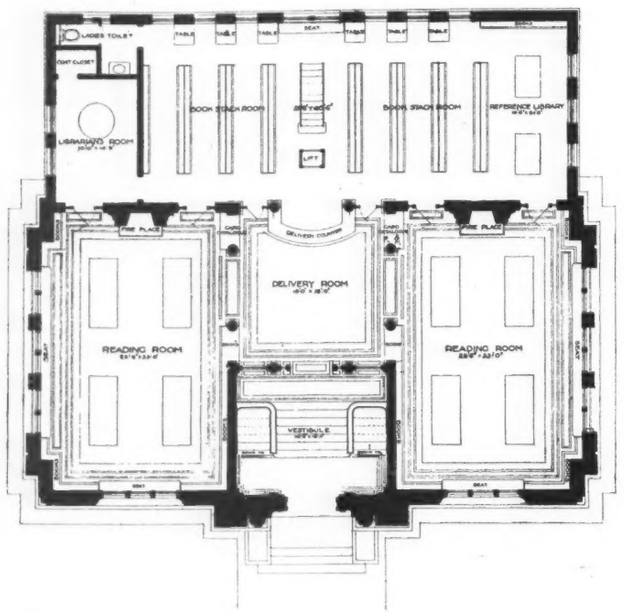
The lighting of large interior rooms is often a difficult problem. Light will not penetrate to advantage more than thirty feet. Skylights, domes and clerestory windows are used. In the case of the dome or clerestory the room to be lighted must be higher than those immediately surrounding it. The clerestory plan, with upright windows, is most satisfactory when available, being cheaper and giving better security against the weather than the skylight. In a large building with interior courts, the lower story of the court is sometimes covered with a skylight and used as a room.

The problem of light is peculiarly difficult in the crowded blocks of cities. A library front may sometimes touch the walls of adjoining buildings, so that light can enter only from the front and rear. If extending more than forty feet back from the street, it will be neces-

sary to narrow the rest of the building so as to leave open spaces on each side, or to introduce a little light by the device of light wells. Occasionally a large city library is found on the upper floors of an office building, where light and air are better than below, and the cost of accommodation is less. The use of elevators makes this feasible.

General Scheme of Shelving

The general scheme of book shelves should be fixed before the plan of the building is drawn. Otherwise the space for books can not be determined and serious mistakes may be made. Between the two extremes of open wall shelves and the close stack a compromise is necessary. The large library will put the bulk of its books in a stack, and bring a considerable selection of the best books into an open room. The small library will begin with books along the walls and provide cases for additions from time to time, as needed. Its patrons will enjoy at first the generous spaces of the open room, without an array of empty cases to offend the eye and cumber the floor. When walls are covered with books a floor case will be introduced, and others, when needed, will be placed according to plan, till at last the floor is as full as it was meant to be, and the basement beneath having served for a time to hold the overflow, a second story of cases is put on top of the first. This process should be planned in advance for a term of twenty years.



FIRST FLOOR PLAN OF THE JOHNSTOWN (N. Y.) PUBLIC LIBRARY

For public access passages between cases should be five feet wide. Cases have sometimes been set on radial lines, so as to bring all parts under supervision from the center. This arrangement, especially if bounded by a semi-circular wall, is expensive, wasteful of space and of doubtful value, except in peculiar conditions. It is not adapted to further extension of the building.

For ordinary books in a popular library the shelf should not be more than eight inches wide, with an upright space of ten inches. Eight shelves of this height, with a base of four inches and crown finish of five inches, will fill eight feet from the floor, and the upper shelf may be reached at a height of eighty-one inches, or six feet nine inches. Ordinary shelves should not exceed three feet in length. A length of two and a half feet is preferred by many. A shelf more than three feet long is apt to bend under the weight of books. For books of larger size a limited number of shelves with twelve inches upright space, and a few still larger, should be provided. The proportion of oversize books will vary greatly according to the kind of library, a college or scientific collection having many more than the circulating library. Any reference-room will contain a large number of such books, and its shelves should correspond.

Shelf Construction and Adjustment

Much attention has been given to devices for adjustment of shelves. Some of these are quite ingenious and a few are satisfactory. No device should be introduced that will seriously break the smooth surface at the side. Notches, cross-bars, iron horns or hooks or ornamental brackets expose the last book to damage. If pins are used they should be so held to their places that they cannot fall out. Heads of pins or bars should be sunk in the wood, and the place for books left, as near as possible, absolutely smooth on all sides. It is at least a question whether the importance of making shelves absolutely adjustable has not been greatly overrated. As a fact the shelves of the circulating library are very seldom adjusted. They may have all the usual appliances gained at large expense, but there is no occasion to adjust them outside the reference room. They remain as they were put up. It is probably well to have the second and third shelves movable, so that one can be dropped to the bottom and two spaces left where there were three at first. But all other shelves might as well be fixed at intervals of ten inches without the least real inconvenience, and the cases be stronger for it and far cheaper. A perfectly adjustable shelf is interesting as a study in mechanics, but it is practically disappointing. Its very perfection is a snare, because it is so impossible to set it true without a spirit level and a machinist. All shelves in a reference room should be adjustable. Bound magazines might have special cases.

Iron shelf construction has the advantage of lightness and strength, filling the least space and admitting light and air. Where three or more stories of cases are stacked one upon another iron is a necessity. It also offers the best facilities for adjustment of shelves and is most durable.

As to Floors and Windows

A floor of hardwood is good enough for most libraries. Wood covered with corticene or linoleum tends to insure the needed quiet. Floors of tile, marble or concrete are very noisy, and should have strips of carpet laid in the passages.

On the walls of reading-rooms it is neither necessary nor desirable to have an ornamental wainscot, nor indeed any wainscot at all, not even a base-board. Bookcases will cover the lower walls, and the books are the best ornaments.

Small tables for four are preferred in a reading-room to long, common tables. They give the reader an agreeable feeling of privacy.

Do not make tables too high. Thirty inches are enough.

Light bent wood chairs are easy to handle.

Steam or hot water gives the best heat, and incandescent electric lamps give the best light.

Windows should be made to slide up and down, not to swing on hinges or pivots.

Without dwelling further on details, let us be sure

1. That we have room within the walls for all the books we now have or are likely to have in twenty years; provide the first outfit of shelves for twice the number of books expected at the end of one year, and add bookcases as we need them, leaving always a liberal margin of empty space on every shelf. We must plan for the location of additional cases for twenty years, with due consideration of the question of public access.

2. That all needed departments are provided in harmonious relation with each other, and so located as to serve the public to the best advantage and at least cost of time, strength and money.

3. That the best use of the location is made, and the buildings suited to the constituency and local conditions.

4. That the estimated cost is well within the limit named, for new objects of expense are certain to appear during the process of building, and debt must not be thought of.

5. That the building is convenient for work and supervision, a point at which many an elegant and costly building has failed.

Make it also neat and beautiful, for it is to be the abiding place of all that is best in human thought and experience, and is to be a home in which all inquiring souls are to be welcomed. Since the people are to be our guests, let us make the place of their reception worthy of its purpose.

SOME GOOD IN OHIO'S NEW CIVIC CODE

So Thinks Mayor Jones of Toledo—Some of the Flaws Pointed Out—On the Whole, Will Improve Civic Conditions in the Buckeye State

*By Samuel M. Jones**

"Republics abound in young civilians, who believe that the laws make the city, that grave modifications of the policy and modes of living, and employment of the population, that commerce, education, and religion may be voted in or out; and that any measure, though it were absurd, may be imposed on a people, if only you can get sufficient voices to make it a law. But the wise know that foolish legislation is a rope of sand, which perishes in the twisting; that the state must follow, and not lead the character and progress of the citizen; the strongest usurper is quickly got rid of; and they only who build on ideas, build for eternity; and that the form of government which prevails is the expression of what cultivation exists in the population which permits it. The law is only a memorandum." The new code for the governing of Ohio cities finely illustrates the truth of this quotation from Emerson's essay on "Politics."

The Work of "Young Civilians"

From start to finish the code bears the marks of the work of the "young civilians" who believe that laws make the city, but we learn from past experience that the law will not materially alter the real conditions of life; that, as a matter of fact, but a very small minority of the people give any special concern to the question of how the machinery of government is constituted, and, as a rule; these are the little coterie in every political division to whom "politics" and "business" are synonymous terms and they pursue both for the same reason, mainly because they find a means of getting a livelihood without working with their hands. The great mass of the people give little or no attention to the subject of associating ourselves together on a basis of political righteousness.

Partyism and its evil brood of hatred, envy, malice and personal abuse has brought the thing known as politics into such disrepute that most men of high and noble purpose shrink from the crucifixion that one who makes a campaign for public office must undergo, with the result that where and while the delusion of partyism holds the minds of men, the work of government will be left to the little coterie who find it profitable business.

I see no particular reason to despair over the code notwithstanding the Chicago *Tribune* says, "it is such a plucky attempt at reaction that it might almost be called insolent." Of course, there is much in it that is a denial of the right of home rule; that was to be expected. Only a very few of us yet believe in self-government; the most of us believe in governing ourselves and some other man or men in the bargain, and so long as that belief dominates us, how can we justly claim any right to expect home rule? Of course, there is much in it that is a denial of democracy. We have not yet risen to that plane of intellectual thinking where we have learned to believe in the democratic principle of the equality of all men. The aristocratic idea is yet the dominant note in ours as well as in every other coercive form of government.

Home Rule Not Altogether Eliminated

I believe the code represents as large a measure of both home rule and democracy as the population which permits it, or rather whose representatives have created it; in fact, as a product of the handiwork of partyism, I think the code is as good as could be expected. We should bear in mind that it was not supposed to be made for the benefit of all the people. The partisan who attempts to legislate is always handicapped by the fact of his false training that his first thought must be to so order things as to perpetuate the party in power, and therein lies the hopelessness of changing to some other party. Until patriotism shall supersede partyism and crush it to earth never to rise again, we may expect just such manifestations of defective law-making as is presented by the code.

The portions that have excited the most public criticism are denial of home rule indicated in the provisions:

First, That the governor of the state may remove the mayor.

Second, Criticism of the shilly-shallying that provides that the mayor may appoint the board of public safety and requiring a confirmation of the council by two-thirds majority; where the confirmation is withheld for thirty days, the power of appointment, following out the aristocratic idea, is placed in the hands of the governor of the state. This is strictly in line with the expected performance of partyism, and, of course, the governor would appoint the men named for him by the machine politicians of the dominant party, whatever its name might be.

Again, it is provided that "vacancies in the office of the judge of the police court shall be filled by the governor for the unexpired term, and vacancies in the office of police clerk shall be filled by the mayor for the unexpired term." In the minds of the "young civilians," who made the law, evidently the matter of appointing the police judge was considered too weighty to be intrusted to the man whom the people should elect to serve them as mayor, and the governor of the state located in a distant city must be called upon to discharge this duty; but the mayor may fill the vacancy in the case of police clerk. It is a rare kind of wisdom that can differentiate with such nicety between this kind of duties, but it is a kind of wisdom that belongs to us all while we are in the "young civilian" period, for we should remember, and again I quote from Emerson, that "Our institutions, though in coincidence with the spirit of the age, have not any exemption from the practical defects which have discredited other forms. Every actual state is corrupt. Good men must not obey the laws too well. What satire on government can equal the severity of censure conveyed in the world politic, which now for ages has signified cunning, intimating that the state is a trick?"

Sure to Have Better Municipal Government

I have no fear, however, but that we shall have better municipal government in Ohio notwithstanding the defects of the code. To some extent, public attention has been centered on this subject. The general trend is toward better and purer forms of society. It will be more difficult in the future to use the machinery of the state for such petty performances as characterized the work of the legislature last winter. Gradually we shall come to understand that the great city needs no more machinery, no more "laws" for its successful operation than is needed for a great private corporation, yet the tangle of laws for governing Ohio cities outnumber the "rules" of any private corporation 100 to 1. We still nurse the delusion that men can be coerced into righteousness, and the law-makers are only catering to the public taste when they make laws to keep the delusion going.

In another place in this remarkable essay of Emerson's he says that "any laws but those which men make for themselves are laughable. * * * * Hence, the less government we have the better—the fewer laws, and the less confided power. The antidote to this abuse of formal government is, the influence of private character, the growth of the individual; the appearance of the principal to supersede the proxy; the appearance of the wise man, of whom the existing government is, it must be owned, but a shabby imitation."

I cannot see that the code enlarges the liberty of the people of the city of Toledo in any way. I believe a single board of councilmen is better than the double board plan, but there is an evil again in this, that is, the facility it affords to legislation.

Law Is No Substitute for Honesty

I think that any thoughtful person who reads this code carefully will see very clearly the hopelessness of making any law that will prove a substitute for an honest man! The remedy and the only remedy is in our own hands. The only way that I see that I can help to bring it about is to be honest myself, live true to my ideal, true to the truth as I see it. Suspicion, doubt, disgust of the good intentions of our fellow men are manifest all through this law. This

* Mayor of Toledo.

is the infidelity, the canker upon which partyism thrives, and if there is any danger that menaces the future of America, this is it. I do not believe there is. I do not believe that the fires of hatred can be kept burning in men's bosoms always by the cheap subterfuges of partyism. Men will not believe in the depravity of their neighbors, no matter how loudly it is preached. A nobler patriotism will inspire us and lead us out of this slough of failure in our municipal governments in which the tangle of law would seek to hold us. We already have the liberty. We may nominate our neighbors by petition circulated on the streets and have their names placed regularly on the ballot as patriots instead of as partisans. I believe that the people will free themselves from the evils that the code seeks to fasten upon them through this channel, and when every man—and every woman too—stands upon and is true to their convictions, free, unheld, and unowned, then we shall be free from the limitations of the code, larger liberty will be realized, democracy will be ours, the dream of the founders of the government will be an accomplished fact.

CHICAGO'S MUNICIPAL LODGING HOUSE*

How the Human Flotsam and Jetsam of a Great American City Is Scientifically Cared for and Returned to the Ranks of Industry

By Raymond Robins†

THE first attempt in the West to apply a scientific method of treatment and a business organization to the solution of this most difficult problem in modern municipal correction has been in operation for three months.

Over six thousand homeless and indigent men have been housed,

RECEIVING THE GUESTS

bathed and fed for from one to four nights. Of this number twelve hundred and six have been given employment through the bureau of the Chicago Municipal Lodging House, and some 70 per cent. permanently replaced in the ranks of industry.

Every evening, at 12 South Jefferson street, for the past three months, from twenty-five to one hundred and forty hungry and homeless men have stood up for registration. The police officer in charge separates this group into two lines—first-nighters and those previously sheltered. As the newcomer steps up to the desk the registration officer, with a pile of blank cards before him, begins his inquisition.

A SEARCHING EXAMINATION

Name and age, place of birth, length of residence in the State and city, occupation, with the names and addresses of his last three employers, and when and how long he worked for each—all this and more goes down in black upon the white. The man is given two duplicate numbered checks tied with a string, and now begins his ascent toward supper, a bath and a bed. Woe unto him if he has been led by fear, or vain desire to deceive, and has lied while telling his brief but pointed history. Within twenty-four hours his tale is brought to proof, and at the Chicago Municipal Lodging House, as in that better land, a liar is an abomination. Once discovered, there he may not enter into rest again.

Entering the first room upon the second floor, and sitting down upon a wooden bench before a plain board table, our lodger receives his one-third loaf of fresh bread, with a pint cup of good hot coffee. This dispatched, he is ushered into a large room supplied with more benches, and, directed by the attendant, he walks to the dispensing window of the sack room.

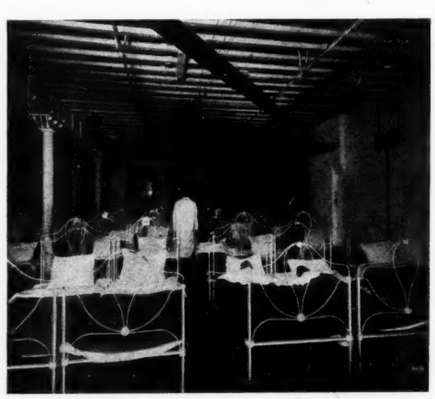
BAD FOR MICROBES

Here he gets a large-meshed clothes sack, and upon this fastens one of his duplicate checks. Sitting down, he forthwith "shucks" himself, and every rag of clothing—hat and shoes and all the contents of his pockets—is put into this sack. The draw strings pulled and tied, this bag is taken to the fumigating room and subjected for some eight hours to the fierce, destroying fumes of ten pounds of rolled brimstone sulphur, burning out all life within it.

Next in order is the bath. This is administered in an open, well-lighted room, eighteen by twenty-four feet, containing eight hot and cold showers, strong soap, brushes and towels without stint. Should this job be poorly done through laziness, repugnance or unfamiliarity with the task, the officer in charge returns him, willy-nilly, and should the lodger seem unequal to the labor, a husky attendant does him to a turn, and he comes forth, if not as beautiful as the lily, surely with a not unpleasant thinning, and, if cleanliness be next to godliness, then much nearer the Almighty than he has been for many days.

BILL OF HEALTH OR THE HOSPITAL

Putting on a pair of carpet slippers and arrayed in that informal fashion that prevailed in Eden before the fall, he presents himself to the skilled and keen discernment of the examining physician. This inquisitor, having found the facts of our lodger's physical condition, writes them down upon the same record card that holds his story given at the desk below. He is now recorded beyond the possible success of "fake" excuses in an attempt to evade his reasonable stint of labor on the morrow. Any victim of an infectious disease is forthwith sent to the isolation hospital. Should he need vaccination, it is done at once, and he is safe from acquiring or disseminating smallpox for at least a year. This service alone is worth the cost of the Municipal Lodging House to the people of Chicago.



HAPPY DREAMS

* This article was originally written for the *Merchants' Association Review* of San Francisco, the editor of which kindly gave permission to publish the article complete, at the same time loaning the cuts for its illustration.—[EDITOR.

† Superintendent of Municipal Lodging House, Chicago.

Clean, Sweet Repose

His physical examination finished, our lodger dons a clean night robe, and, going up another flight of stairs, finds himself in a warm dormitory. (There are two sleeping rooms, each containing one hundred small enameled iron beds supplied with a spring mattress, blankets and pillows). Here he is met by an attendant, who takes him to a bed of corresponding number with his check, and our lodger enters into silence—and perchance a dreamland musing over better days.

At half-past five each morning all the men are called, and, coming down to the dressing room, each gets his sack of clothes. After toilet and a breakfast of just the kind, quality and size of the supper supplied the night before, our lodger with his fellow sojourners for the night is sent to the office for distribution.

The Chance to Work

When all the men have filed in, the superintendent calls attention to the rules of three hours' labor on the city's streets for all able-bodied men, and then explains that the city's interest is in having her citizens engaged in honest, independent work, and if they have a fair chance for remunerative employment for that day, and can tell a straight story, they will be excused from street work and sent at once upon their way to industry. The warning follows that each man's story will be investigated before the going down of the sun, and if he is found a liar the Municipal Lodging House is closed to him forever and a day.

Now begins the rarest chapter in all the book. Hard-luck experiences, stories of dissipation, disease, accident, industrial displacement, and fairy tales that would turn Hans Andersen green with envy, flow like a troubled river for an hour and a half. All the evils in Pandora's box have here a victim, and every vice a votary, but John Barleycorn is easily the greatest potentate among them all. Fully seventy per cent. of the unfit are his vassals, and carry his stamp upon their brows. With the handicap of the record card, containing last night's story in black and white against him, the only way of safety for the lodger is the truth. If he varies a hair's breadth from his original story he is promptly brought to book and checked into the street gang for three hours' labor with a hoe. As the cases are disposed of, three main classes of the able-bodied are formed.

Promotion Is Rapid

First—Those who have secured employment for themselves, and can return that day into the ranks of industry.

Second—Those who have worked, and worked well, upon the streets the previous day, and, their references having been investigated and found good, are to be sent to those firms and corporations that employ worthy men from the Municipal Lodging House. If there is no employment reported for that day, these men are given the entire day to seek for work.

Third—"First-nighters" and others whose record is not satisfactory, and who must work upon the streets if they lodge at the city's charge.

The first class go at once, taking a card to be signed by their employer or foreman, and which is returned by mail or otherwise to the Municipal Lodging House.

The second class are sent to those public-spirited firms and corporations that, seeing the value of the work of the Municipal Lodging House, give it the substantial co-operation of employing the worthy lodgers whenever they have vacancies.

The third class are taken in charge by a foreman of the City Street Department, and under the supervision of an officer of police, are required to work three hours upon the city streets. Each of these men is given a card, and when his stint of work is finished the foreman writes a record of the quality of the lodger's labor upon this card and attests it with his signature.

The Sick Are Cared For

When these classes are disposed of there yet remain the crippled, sick, physically incompetent and delinquent class. The Municipal

AT BREAKFAST

Lodging House, as a clearing house for the indigent, endeavors to secure the final disposition of each case. In making this distribution a single night's registration sometimes calls into helpful co-operation nearly all the charities, public and private, in Chicago.

We have been able to help into honorable independence many worthy but temporarily displaced men, to return some truant youths to their homes, to uncover not a few professional loafers, "barrel house bums," and to reduce greatly the number of able-bodied vagrants in Chicago.

A four-story building centrally located and equipped to house and feed daily 200 men is the centre from which is intelligently administered this self-help, charity and correction.

The total cost of renting and equipping this plant was less than $6,000. The annual cost will be under $15,000.

The Chicago Municipal Lodging House has come to stay.

PROPOSED CHARTER FOR HOUSTON

Practically a new charter will soon go into effect in Houston, Texas, as the old one is to be radically changed. The city limits are to be enlarged to four miles square, the centre of the Court House Square being the centre of the city. The city has been granted larger powers than ever before, and can now build hospitals, workhouses, etc.; may establish a system of pensions for firemen and policemen; has absolute control over the schools. The city will have the power to regulate transfers and car fares. A method of city accounts is prescribed, and sections of the city will be allowed to have local option as regards the liquor business. The mayor will have the power to appoint all heads of departments except the city comptroller. He may also appoint all employees in the lower administrative service of the city, except in the case of laborers and city firemen. The council will be able to establish a municipal civil service commission to regulate the employment of city officers. Before any franchise can be granted by the council the ordinance in which it is embodied must specify the terms, rates, and charges in full, and it must be published in the daily newspapers for at least thirty days. A five-sixths vote of the council is required to pass such franchise. The city comptroller will be a new officer and will be elected or removed by the city council. He will have charge of the books of account and the financial end of the city and must audit all bills and claims against the city.

Another section of the charter deals with the primary elections, providing that these elections for all city officers must be held not less than twenty days before election; that it will be unlawful for any candidate to hire, directly or indirectly, any carriage or other conveyance for bringing voters to the polls, and if any candidate is found guilty of using campaign funds in any manner whatsoever, the vote for such candidate is to be void, and the candidate receiving the next highest vote is to be declared the nominee. If all candidates are found guilty the committee, or others in authority, shall proceed to fill the offices by appointment.

SEWAGE PURIFICATION BY SEPTIC TANKS*

Some Objectionable Methods -Septic Tank Successful at Vancouver—How the Tanks Were Constructed—How the Sewage Is Purified—The System Described by Chairman of the Board of Health

By M. J. McGuigan, M.D.†

THE economical disposal of sewage is a problem which has engaged the attention of engineers and scientists for a great many years with varying results. Sand filtration, sewage farming, chemical precipitation, bacterial filtration are the most notable processes tried and found wanting.

SOME OBJECTIONABLE SYSTEMS

In sand filtration, continuous or intermittent, the area of suitable

ALL THAT APPEARS ABOVE GROUND OF THE SEPTIC TANK

sand ground required is usually difficult to obtain in the neighborhood of a city, and if obtainable the elevation or position is such as to necessitate pumping and consequent continuous expense.

Sewage farming is growing into disuse for principally the same reason.

Chemical precipitation is expensive both on account of the cost of the chemicals and handling and also the dealing with the "sludge" which is produced in excessive quantity. The effluent is also liable to become offensive.

Bacterial filtration has been used with considerable success, but taken alone there are objections to it. In treating raw sewage the filters become clogged and require to be of considerable size and conseqnently expensive construction.

SEPTIC TANKS

The most effective method of treatment of sewage, so far known, is the septic tank either used alone where the discharge is into salt water, or where a high degree of purification is not necessary, or in conjunction with bacterial filters where the effluent must be comparatively pure.

The tanks are usually constructed of concrete arched over and of a capacity equal to eighteen to twenty-four hours' flow of sewage, with a depth of about five feet, the inlet and outlet pipes being turned down to a depth of about 13 inches below the surface so as to leave the scum, which forms on the surface and in which the bacterial action is carried on, undisturbed.

After the tank has been in use about a week a brown scum forms on the surface which gradually increases until the full action is attained. In this scum the action, of what are known as anaerobic bacteria, goes on, the greater part of the sewage being liquefied and a very small deposit resembling black ashes being deposited on the bottom. Analyses shows that about 90 per cent. of the organic matter in suspension and about 30 per cent. of that in solution are removed and that the deposit does not require to be removed for several years.

The practical result undoubtedly is that the offensive matter of the sewage is destroyed and the effluent in sufficiently clear for discharging into salt water, or where a high degree of purification is not necessary.

Where discharged into a running stream, or where greater purification is desirable, a small bacterial filter or set of filters may be added. In such a case a much smaller area of filter is necessary than if filters alone are used as the effluent from the septic tank will go through at least four times as fast as the raw sewage and the filter beds are not liable to be clogged.

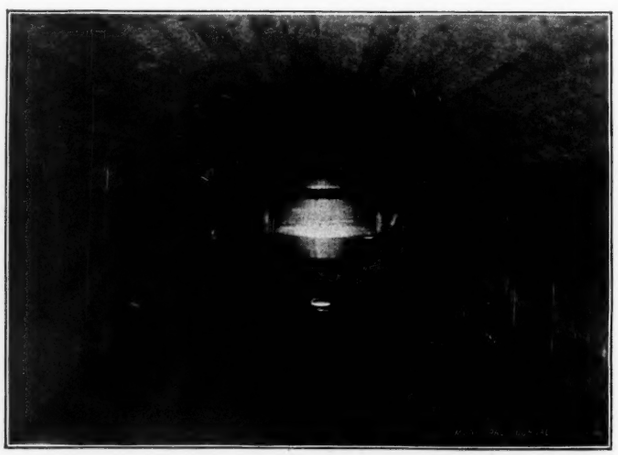
THE VANCOUVER SEPTIC TANKS

The city of Vancouver, British Columbia, is situated on the south shore of Burrard Inlet and the east shore of English Bay and is divided almost into two portions by a small arm of the sea, known as False Creek which extends from the Bay parallel with Burrard Inlet to within half a mile of the eastern limits of the city.

Prior to 1899, there was one sewer discharging into English Bay and four sewer outlets into Burrard Inlet, but there was no sewerage for that portion of the city which would naturally drain into False Creek (a great portion of which was tide flats). In order to sewer that portion it was necessary to provide some means of treating the sewage before discharging it into the salt water to prevent it becoming offensive and depositing sewage matter on the tide flats.

Various forms of bacterial filters were suggested, also septic tanks, with or without filters, and in March, 1899, Mr. Jas. F. Garden, C. E., Mayor, and the City Engineer, were deputed to go and examine the tank in operation at Champaign, Ill., designed by Prof. N. H. Talbot of the State University of Illinois.

The result was so satisfactory that on their return they recommended the Council to adopt the system where sewage was to be



ONE OF THE SEPTIC TANK CHAMBERS

discharged into salt water where the current was not sufficient to carry it entirely away.

Plans were obtained from Prof. Talbot, but the Septic Tank Syndicate having obtained Letters Patent in Canada, threatened, through their agent, to institute legal proceedings if the city adopted the system without paying them. The City Solicitor finally advised the

* A similar septic system of sewage treatment to the one here described by Dr. McGuigan was installed not long ago at Glencoe, Ill.—an attractive suburb of Chicago, eighteen miles north on the Lake Shore—by the Cameron Septic Tank Company, of 706 Dearborn street, Chicago.—[EDITOR.

† Chairman of the Board of Health, Vancouver, B. C.

city to accept the terms of the Syndicate to supply plans and necessary ironwork fittings for the sum of $1,500 for three tanks of capacities of 2,000, 3,000 and 5,000 inhabitants respectively.

How the Tanks Were Constructed

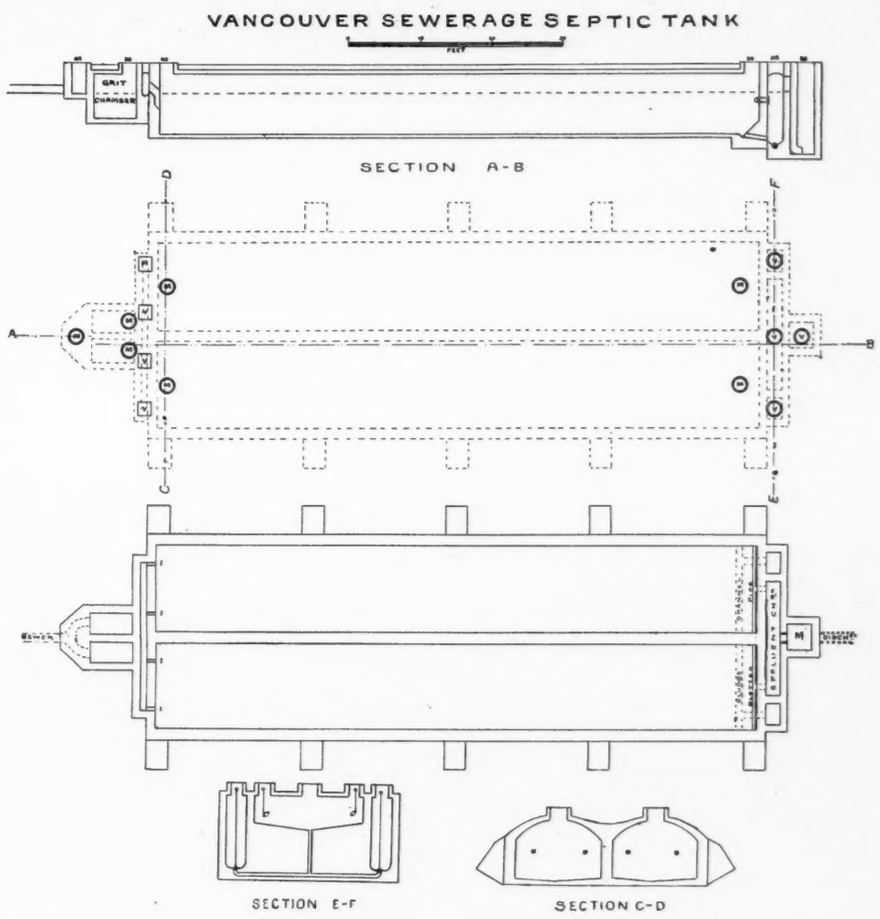
The tanks were built of concrete arched over with the same material and were put into use about the beginning of 1901—see accompanying drawings.

Some slight changes were made from the plans furnished by the syndicate, so as to do away with any woodwork in the construction, the influent and outlet channels being arched over and all the manholes iron, carried up to the surface. The surface was covered with earth, levelled and seeded, and is not in the least unsightly, only the manhole covers showing at the surface to distinguish it from an ordinary lawn.

After being in use a short time a slight scum formed on the surface which increased during the warm weather, the purification of the sewage becoming more decided, as the growth of the scum, in which the bacterial action is principally carried on, progressed.

The best results so far appear to be attained with the largest tank near the Crematory, into which five or six loads of night soil a week are dumped, the scum on the surface of this tank being much thicker and the effluent clearer than from the others in which the sewage is more dilute.

The practical results are quite satisfactory and there is no odor from the tank or the effluent.



From our experience, we are satisfied that septic tanks are sufficient in most cases for sewage purification, where the discharge is into salt water, or streams which are not used for water supply, and where necessary to use filters to obtain more thorough purification they increase the capacity of the filters by destroying the greater part of the solid matter of the sewage.

How Sewage Is Purified

What are bacteria? I have stated above that the purifying agency in the septic tank was the anaerobic bacteria, and it might be just as well to say a word about bacteria themselves. Bacteria are minute forms of vegetable life allied to the algae, and they can be roughly classified as (1) parasitic (needing a living host), (2) saprophytic (living on dead animal or vegetable matter) and (3) those which adapt themselves to circumstances and exist indifferently as parasites or saprophytes.

Bacteria are also distinguished according to conditions under which they live and may be either anaerobic (living without air—that is without free oxygen) or aerobic (existing with free oxygen). They vary in size from 1/15000 of an inch to 1/2500 of an inch in diameter. Multiplication usually takes place by division. Each half grows to the size of the original bacterium and then splits in two. They grow very rapidly. With plenty of food and proper conditions a single bacterium will multiply itself to almost incredible numbers. In twenty-four hours one bacterium would produce 16,000,000; in two days 47,000,000,000, and in a week the number expressing them would be made up of 59 figures (Cohn).

The work the bacteria do in the purification of sewage is first to break down and then to oxidize the foul matters of which it is composed.

Mostly all sewage is made up of various compounds of carbon, hydrogen, nitrogen and oxygen and the action of the bacteria may be illustrated by the following formulae:

$$\left.\begin{matrix}4\text{ Albumen} + 14\text{ Water} \\ 4\ C_8H_{13}N_2O_3 + 14\ H_2O\end{matrix}\right\} = \begin{matrix}4\text{ Nitrogen} + 19\text{ Methane} + 12\text{ Carbon-dioxide} + 2\text{ Hydrogen.} \\ 4\ N_2 + 19\ CH_4 + 12\ CO_2 + 2\ H_2\end{matrix}$$

$$\left.\begin{matrix}2\text{ Albumen} + 26\text{ Water} \\ 2\ C_8H_{13}NO_3 + 26\ H_2O\end{matrix}\right\} = \begin{matrix}4\text{ Ammonia} + 16\text{ Carbondioxide} + 33\text{ Hydrogen.} \\ 4\ NH_3 + 16\ CO_2 + 33\ H_2\end{matrix}$$

This is nature's way of reducing highly complex compounds to their original elements.

AN ALLY FOR MUNICIPAL ART

'Twas the home of a poor man, and all through the house
There was not enough fuel to warm up a mouse!
And the wife and six children in bed were close rolled,
With the thin quilts drawn tight just to fend off the cold!
There's a noise at the door and the husband comes in,
With delight in his eyes and his lips in a grin—
"Cheer up, my own love, and let cold weather come—
I have swiped seven billboards, and that will help some!

Here is one praising 'Force,' and with strength that should blaze—
Here's a Child's cigar board—what a smoke that will raise!
Here's a real estate sign—well, that burns dirt cheap;
Here's a Cascaret board—that shall work while we sleep!
I have other boards, too, but, my love, that's enough
To show how I've brought in the real fuel-stuff!"
And the glad flames leaped high, while each deeply pleased heart
Rejoiced in the cause of Municipal Art!—*Exchange.*

PAVEMENTS INJURED BY WATER

All Kinds of Pavements More or Less Injured by Water, Even Stone—A Record of Some Experiments—The Solubility Test Needed in All Specifications

*By J. W. Howard, B.L., C.E.**

MUCH has been written about new pavements and how to lay them. Little is recorded concerning the causes of injury to pavements and their maintenance in constant good condition. The element of durability often diverts the attention from other important points, as uniformity or smoothness of surface, ease of traction, size of loads possible, sanitary requirements, ease of cleaning, facility of crossing any part on foot, suppression of jarring and noise, beauty of street, access to pipes and ease of repairing the pavement equal to new, and the possibility of so constructing a pavement that it can be kept in constant good condition.

MORE ATTENTION NOW GIVEN TO THIS PHASE OF THE WORK

In many cases of Europe and in increasing number in America, I notice that more attention than formerly is being given to maintenance and the removal of the causes of decay or damage. Better construction and quicker attention to small repairs is apparent; a stitch in time saving nine. Prompt repairing is economical and good in every way, except for a certain class of politicians, as only small sums are needed at short intervals and it all goes into the pavement. Large amounts for new pavements to replace the old are not needed, offering little or no chance for "political expense" money from contractors or their agents. There is plenty of room for new pavements because three-fourths of the streets of American cities opened for use are not yet paved. There are also many old and very poor pavements beyond repair which need new and better ones in their places.

True maintenance is keeping a pavement in constant, efficient condition by preventing and repairing damages from decay, disintegration, destruction due to water, traffic and other causes.

The principal cause of injury to most pavements is water, to which we will confine our attention in this paper, omitting the other causes, each of which is worthy of special study. Water does the damage either as liquid, as vapor, or by freezing. It does it in several physical and chemical compounds. It makes it possible for traffic to do great damage by first softening or loosening a pavement.

Traffic of vehicles, which a casual observer thinks does the most damage, is of itself, less injurious than water. The comparitively light and small amount of traffic over the streets of American cities, compared with like cities and pavements in Europe, would do little injury, were it not for the poor condition of our pavements due to water acting in various ways. A pavement once uneven from moisture or frost is easily and rapidly further spoiled by traffic. Pavements laid and maintained so that water can do them little harm, are very slowly affected by traffic. This is shown by Table No. 1, which gives the traffic and kinds of pavement on some principal streets of ten cities of Europe and America. The number of vehicles are those passing both ways over an imaginary line across the street at its busiest part. These are average results of counting based on records which I saw taken, and official counting which was placed at my disposal in the foreign cities when last there in 1900, supplemented by some which I have lately made.

Most educated people are familiar with many, if not all, the cities and streets given. The heaviest traffic is over the best maintained streets of the European cities; the lightest is over the more uneven streets of our cities. The cause of uneven pavements is, therefore, not primarily the traffic. It is because many of our streets are so paved and so poorly repaired that water weakens them from below, within, above, making it easy for a comparatively light traffic to render the pavement uneven and worse. Water combines with dirt and grit on the surface, softens the pavement, facilitates the grinding and pounding action of wheels, so that holes appear. These holes retain water and steadily become deeeper. Well cleaned and promptly repaired streets do not easily hold water upon them and thus last much longer.

* Consulting Engineer, 1 Broadway, New York. This paper was read before the last session of the American Society of Municipal Improvements, held at Rochester, N. Y., last October.—[EDITOR.

TABLE 1. HEAVIEST VEHICLE TRAFFIC IN TEN IMPORTANT CITIES

City.	Street.	Pavement.	Vehicles per day.
Paris, France	Rivoli	Wood—Block	33,232
	Opera	Wood—Block	29,460
	P. Neuf	Granite—Block	20,682
	St. Honoré	Asphalt—Rock	16,598
	Cambon	Asphalt—Rock	13,040
London, Eng	Oxford	Wood—Block	16,886
	Strand	Wood—Block	16,208
	Parliament	Telford—Macadam	14,306
	Grace Ch.	Asphalt—Rock	12,148
Berlin, Ger	Potsdam Pl.	Asphalt—Rock	17,308
	Friedrichts Pl.	Asphalt—Rock	13,479
	Chaussee	Wood—Block	13,442
	Leipzig	Asphalt—Rock	11,345
	Koenig	Asphalt—Rock	10,016
	Potsdam Br.	Granite—Block	8,793
New York	Broadway	Granite—Block	8,188
	Fifth Avenue	Asphalt—Mixture	6,246
	Madison Avenue	Asphalt—Mixture	5,142
	Wall	Asphalt—Mixture	2,443
	Chambers	Asphalt—Mixture	2,434
Philadelphia	Broad	Asphalt—Mixture	6,176
	Filbert	Asphalt—Mixture	5,185
Boston	Devonshire	Granite—Block	5,410
	Kilby	Asphalt—Mixture	3,503
Chicago	Clark	Granite—Block	4,691
	Wabash	Granite—Block	3,794
Washington	Fifteenth	Asphalt—Mixture	4,687
	Ninth	Asphalt—Mixture	1,965
St. Louis	Locust	Asphalt—Mixture	3,496
	Broadway	Granite—Block	3,159
Buffalo	Main	Asphalt—Mixture	2,941
	Linwood	Asphalt—Mixture	697

NOTE.—Width of streets and weight of vehicles are not here recorded. I have these and find they do not affect the comparison here desired. All are on concrete foundations.

HOW TO AVOID DAMAGE BY WATER

A well laid pavement requires a subsoil, drained naturally or artificially. Water below undermines or softens the subsoil, causing settlements. It freezes and forces up irregularities in the surface. Water often works up through imperfections in a concrete foundation and gathers in various ways on its upper side, thus getting below the blocks of stone, brick, wood, or under asphalt pavement surface and above the concrete. Water displaces, disintegrates and injures that which is above. It is conceded that a dry and solid, compact sub-soil is needed under all roadways.

Curbstones, manhole frames, stop-boxes, street car rails, etc., at their points of contact with pavements must be kept from displacement by water or frost, otherwise the pavement itself will suffer.

An earth road is essentially a strip of land freed from water by various means, especially by side ditches and a high, sloping cross-section.

A gravel road is an earth road with a harder surface. It must also be kept as free as possible from water on or under it.

A Macadam road is a degree firmer than gravel. It sheds water from its surface fairly well, but it must be on a well drained subsoil. No depressions tor water should be permitted to remain on a Macadam road. Small constant repairs are the most economical way of keeping the road free from surface water.

A Telford road is an approach to a permanent pavement which can be kept in order in all weathers and at some expense even under heavy traffic. It is simply a question of cost of repairs or maintenance. The large foundation stones of the Telford system, laid with flat sides down, are permanent. They, with the spaces filled with smaller broken stone, sustain the wearing surface of more broken stone above. This surface is easily and quickly repaired. The Telford foundation is self-draining and disposes of water which may seep through the wearing surface. Under-drains, where needed, do the rest.

Telford foundations are successfully used in many places instead of concrete, under stone block and other pavements. They sustain heavy traffic in Berlin on the granite blocks above and are cheaper than concrete for like service there. Being on a sandy soil they provide a self-draining, firm support. Where hydraulic cement is very expensive and where proper store can be had, thick, compact Telford foundations are worthy of careful consideration.

Even Stone Pavements Are Affected by Water

Stone block pavements are often very uneven although the blocks are each of good shape. Single blocks or groups of blocks have been raised, lowered or twisted by water or frost between or below them. Our cities each have much of such uneven block pavements, aggregating many thousand miles of roadway, not worthy of our civilization. Much of this is on sand or gravel, also not properly drained. If the subgrade had been properly drained and consolidated, and some crushed stone rolled hard under the gravel or sand, slightly better results would be possible.

When hydraulic cement, bituminous cement or Telford stone foundation is used under pavements, the joints between the blocks, unless effectually closed with water-tight filling, permit water to get between the upper pavement and the base and do general damage. The injury and cost of repairs in such cases are greater than the expense of filling the joints at first.

Incidentally health is injured where water assists disease germs to find a nest for breeding between and under blocks and permeable paving materials. Most people have noticed the filth around and under a wet paving block, without grouted joints, when taken up. In addition to dangerous germs sticking to our shoes and clothing on wet days and our breathing them in dust on dry days, the eyes and throat are injured by certain contaminated vapors from water-soaked pavements.

Another cause of water absorption by pavements is in contraction and expansion which opens and closes joints in block-formed pavements and causes cracks in some sheet pavements, especially those made of some asphalt mixtures. This matter needs constant and prompt attention or a pavement gets beyond economic use and repair.

All paving materials absorb more or less moisture. This tends to disintegrate the pavement and assists traffic to do damage. Porous stone and porous brick are easier crushed when wet. Some asphalt pavement mixtures, containing soluble salts and clays, of which much is on our streets, are an apt illustration of damage done by absorbed water. Decay appears in holes, slight at first, then large, especially in the gutters. Water absorption and solubility tests should be applied to more of the materials used for pavements, not excepting the component parts of asphalt pavements. This would be opposed by certain financial interests but the asphalt mixture pavements would benefit thereby and in the end be better for all concerned, both city and contractor.

The asphalt-rock pavements, as a class, and a few of the synthetic asphalt pavements, are not open to this objection, but they will not be harmed by water absorption and solubility tests being put in city specifications.

In Table No. 2, I give the water absorption of a few paving materials I have tested. The per cent. is the increase in the original weight of the material after water has been absorbed for twenty-three hours, the sample having first been dried at 300° F. for 7 hours. They were all easier crushed when thus wet than when dry, some more so than others.

These absorption tests do not show solubility which is done in another way by powdering, dissolving, filtering, etc., which can be applied to asphalt paving materials. The absorption, like other tests, does not alone determine the value of a paving material. They can be used to fix safe limits for each material, based on experience.

Several kinds of stone and bricks chip at the corners and even crack through easier when wet than dry.

We will briefly consider asphalt pavements which, after many previous experiments, first succeeded in 1854 on rue Bergere, Paris. It was a rock-asphalt (bituminous limestone) crushed, ground, heated and compressed in place. During the succeeding forty-eight years this general class of asphalt pavement has spread to all the large and many small cities of Europe. It is found to a limited extent in several American cities. One secret of the success of the rock-asphalt pavements, even under the heaviest traffic, heavier than in America, is that it is very dense and compact and does not absorb water. Traffic thus cannot easily attack its particles but passes over its surface. Cleanliness and prompt repairs make asphalt pavement economical to maintain. The severest usage is when such a pavement is simultaneously sanded dirty or watered and subject to heavy traffic. Unless the asphalt pavement is very dense and hard, an emulsion forms and the surface gives way rapidly, as in the case of some American asphalt mixture pavements laid in Berlin and Paris by persons who seemed not to realize what really heavy traffic and moisture would do to their pavements. Like examples are found in large American cities.

TABLE No. 2.

Kind of material.	Per cent. water absorbed.	Remarks.
Trap rock	0.89	Same as basalt.
Granite	0.83	Varies with quarry.
Porphyry	0.50	
Compact limestone	0.85	
Ordinary calcite	0.59	
Hard sandstone	1.41	Very compact sample.
Ordinary sandstone	2.30	Average sample.
Poor paving bricks	10.40	Little used.
best paving bricks	0.60	1.50 p. c. is good test.
Poor wood blocks	30.20	Worst kind.
Best treated wood	2.10	
Slag or scoria block	1.15	From furnaces.

The asphalt pavements of the United States are principally artificial bituminous sandstones. This is because the deposits of natural asphalt-rock were not formerly available in several central and western states, and because the cities first paved were near the Atlantic Coast where asphaltum or mineral pitch was easily imported and used for cementing together the sand and powdered limestone of this synthetic pavement. This class of pavement involves many variables, as kinds of asphaltum, and residuum oil or other flux, various sands, proportions of mixtures, temperatures of mixing, etc.; also the personal factors of the men in different cities. Some of the materials have often contained salts, clay and other matter soluble in water. Some of the resulting pavements are rapidly injured by water. Excellent synthetic asphalt pavements can be made from many kinds or brands of asphalt, found at a large number of deposits in the United States and adjacent countries, provided the asphalt is properly treated and refined to make it insoluble in water and a like precaution in respect to the sand and other materials used. In addition there are other important tests which do not refer to water and need not be discussed here.

The Water Absorption Test

Water solubility tests should be in every specification. Washington has made a start in this respect, especially as one of the refined asphalts very largely used in our cities contains too large a per cent. of water-soluble substances to make as water resisting pavements as those made from purer asphalts containing a higher per cent. of bitumen.

The asphalt-rock pavements are a class, as a whole, less affected by water than the synthetic class. While they are practically the only ones used in Europe, they have made slow progress here. This is due, first, to the combined opposition of the interests of the companies laying the mixture pavements, also to the large freight expense on asphalt-rock from Europe and from similar or equivalent quarries in our country in the middle and far west. The past twelve years have developed a growing successful use of asphalt-rock pavements from several supplies in California, Utah, Texas, Kentucky and elsewhere in our country. Many streets are found with adaptations of this class of American pavements in San Francisco, Sacramento, Salt Lake City, San Antonio, Buffalo, Louisville, Columbus, Indianapolis and many other cities. The principal cost is one of freight, or distance from sources of supply of asphalt-rock. This class of pavement can be laid with excellent results by proper treatment and should always be provided as a competitor with the best of the synthetic class.

Let us consider the enormous amount of water which falls as rain on pavements of all kinds. New York gets about 8,000,000 gallons per mile of streets, and approximately the same in most of our cities. This is an average of 1 1-3 gallons daily per square yard of pavement, not including sprinkling, etc.

It is evident what a strong foe water is and why many pavements become uneven. Traffic over a water-sick pavement easily destroys it. Good waterproof construction and prompt repairs mean economy and efficiency from every standpoint.

Great progress in good paving has been made in many cities. Paving is worthy of attention of the best engineers and special study, for well paved and well maintained streets are of vital importance to the health, comfort, wealth and success of city life.

CIVIC AFFAIRS IN BRITISH MUNICIPALITIES

Municipal Ice and Coal—Municipal Day Nurseries Recommended—Birmingham Municipal Plants Pay More Than $600,000 Toward Lowering of Taxes

By Our Special Correspondent

Municipal Ice

The corporation of Wolverhampton, began, some little time ago, to sell to the public, the ice that was left over after the stall-holders in the Market had been supplied, and the Town Clerk is the authority for the statement that the corporation manager had declared his intention to capture the Wolverhampton trade. It is also stated that there is a friendly understanding between the city and the Linde Company, to which the contract for machinery was offered, to the effect that the latter would not compete with the undertaking of the city.

Municipal Day Nurseries Recommended

At a recent meeting of the Kensington (London) Borough Council, the Medical Officer submitted a special report on the high rate of infant mortality in the borough, suggesting several remedies for the evil. He said that the discomfort, untidiness and unhealthfulness of many of the homes of the poor were largely due to sheer ignorance, and that he believed that there would be no diminution in infant mortality until instructions in the principles of sanitary law and hygiene form part of the system of state education. He further urged that the need of municipal crèches, which might be managed by ladies of leisure, and, in connection with which there should be a municipal milk depot where the mothers could procure pure milk for the little ones.

Municipal Crematories

Several English municipalities propose to erect crematories in their cemeteries, or some other convenient location, to provide a public means for the disposition of the dead by cremation when desired. The park and cemeteries committee of the City Council of Bradford has instructed the City Architect to prepare plans for a crematorium, to be erected in the cemetery, the cost of the building not to exceed $24,350.

At a recent meeting of the St. Pancras Borough Council it was recommended that $200 be appropriated to defray the expense of the Borough Surveyor, the Clerk, and two Councillors, in visiting provincial crematoria, with a view of obtaining information which might be useful in the construction of the crematorium which the Council is to erect at Finchley.

Street Naming

It has been suggested that a new official be created for the County of London, whose duty it shall be to not only keep a register of the names of the streets in the county, but also to arrange for the change of name where there are two or more streets with the same names. That there is need of such an official is only too evident, when it is remembered that there are already in the county twenty-four streets or places bearing the name of "Alexandra," twenty of "Edward," six of "King Edward," eight of "Gladstone," six of "Beaconsfield," and twenty-one of "Salisbury." It has been claimed that the County Council does not allow duplication of names, but in refutation it is sufficient to say that there are, for example, at this moment, two Milton Roads in London, N., and that one of them has but recently received its name, while there are other roads of the same name in other Postal Districts.

Municipal Coal

On the motion of an Independent Labor member, the City Council of Bradford, England, has just decided to start a municipal coal business. The claim is made that since the city buys coal for the Mayor's parlor at $3.50, and the workman at present has to pay $5.25 for the same grade of coal, the municipality will be in a position to greatly benefit the rate-payer. The London *Argus*, which is a conservative weekly, devoted to a "review of municipal life," comments as follows: "It all seems beautifully clear on paper, but various practical questions, notably that of distribution, occur to one, and until the system is actually working we shall be very skeptical about that seven shillings' saving effected by a beneficent municipality. Anyway, the step is a bold interference with the course of trade, which will require a good deal of justifying. If a municipal coal business is legitimate, there is scarcely a department of trading which a municipality might not embark upon."

Municipal Public Houses

At a recent meeting of the Temperance Legislation Board, the presiding officer, Viscount Peel, favored the establishment of municipal public houses. Such an undertaking for an American city would be most shocking to the delicate sensibilities of the temperance workers, but to English or Continental cities it would not draw forth a single shudder. The Viscount said: "I believe that the solution of the drink problem lies in municipal rather than in private control, and I would like to see the experiment tried! I would be glad to see a great city the size of Birmingham, Liverpool or Manchester, working all the public houses in its area for the benefit of the town, the Watch Committee, however, having no concern with their management. This suggestion might seem rather surprising after the terrible onslaught in *The Times* against municipal trading (municipal ownership in America), but big cities contain men who are fit to become Ministers of State, and surely such men are able to manage their own affairs."

Municipal Electric Lighting

At an electrical exhibition, recently arranged by the Brighton Borough Electrical Engineer, the Mayor called attention to the fact that Brighton was the second municipality in the United States to take advantage of the Electric Lighting Act of 1882, and to supply electrical energy to its citizens. At the close of the first fiscal year, 1892, there were 213 consumers, 11,250 lamps, an output of 156,000 units and an income of $22,780. At the close of the last fiscal year the plant had 3,285 consumers, 208,460 lamps, an output of 4,860,000 units and a revenue of $288,765.

During the same period, the average price of electricity had dropped from 14 cents per unit in 1892 to 5½ cents in 1901, thus showing that the Brighton consumers had electricity at almost the lowest rate to be found in the country, though the city is far removed from the coal fields.

The corporation (meaning the city) has acquired ten acres of land, three miles west of the Borough, where it will be possible to obtain coal by sea, and where, also, there will be an unlimited supply of condensing water. On this site the authorities are now building one of the largest power houses in the Kingdom, at a cost of over $2,191,500, and it is expected that a still further reduction in the price of electric lighting will be made.

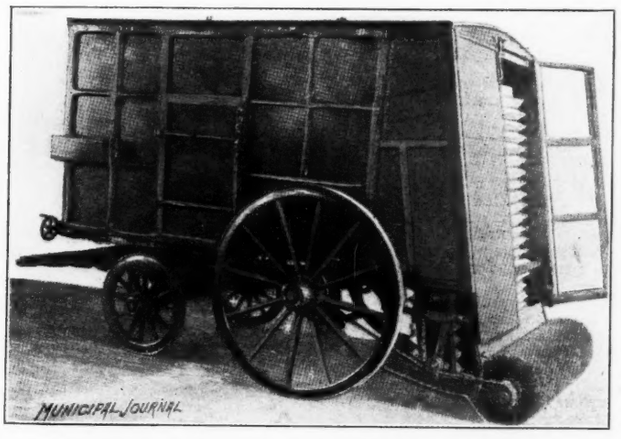
Municipal Trading Lowers Rates

There are, perhaps, no stronger opponents to what is called municipal trading in England, but what is known as municipal ownership in America, than can be found in this country, although it is the reputed home of more profitable municipal undertakings than can be found in any other country. The opposition, of late, has practically crystalized into what is often referred to as the "anti-municipal party" and its mouthpiece is *The Times* (London). Most bitter attacks have been made not only upon the principle itself, but the most unwarranted, unreliable and exaggerated statements have been made in *The Times*, and elsewhere, about the failure of municipal trading in English cities. As evidence, submitted in refutation to these misstatements, an account of the situation in Birmingham, which has often been misrepresented, given by a conservative paper, is quoted:

"The City of Birmingham has not yet acquired possession of all the most profitable municipal undertakings. It only recently acquired the electric lighting supply, paying a heavy premium rather than permit the company to continue in occupation. It paid $2,100,000 for an undertaking upon which the company had spent $1,095,000. Although the capital account was increased to $2,718,285, there was an increase in the first year of corporation (city) management in the net profit, after providing for depreciation and sinking fund—a larger amount than the company had—of $11,500. The average charge was reduced from 9.76 cents per unit to 8.4 cents. So far this department has not contributed anything in aid of rates, although it has been self-supporting. The tramways, on the other hand, which are in the hands of a company, entail a slight charge on the rates for the repairs of the permanent way. The rates have increased 9 cents during the last five years. The increase has been due to the provision of hospitals for dealing with scarlet fever and smallpox, to the extent of 4 cents in $5, and to the increased demands of the school board and of the drainage board, which deals with the sewage of the city and the neighboring districts. The amount contributed to the rates from the surplus profits of the gas and water undertakings during the last five years was $618,640. Judging by the experience of other cities, the municipal operation of the tramways would mean, besides greatly reduced fares, extended and improved services, a much further relief of local taxation."

A New English Street Cleaner

An English inventor has recently placed on the market a new street sweeping machine for which great claims are made. "The apparatus," as described in the April number of *The Street*, London, "is essentially a combination of a dust-van and a rotary sweeper, with an elevating mechanism as the conecting link. The usual rotary brush is employed at the rear of the vehicle, only differing from the ordinary horse-broom in that it can be fitted parallel to the axle of the vehicle in this case.

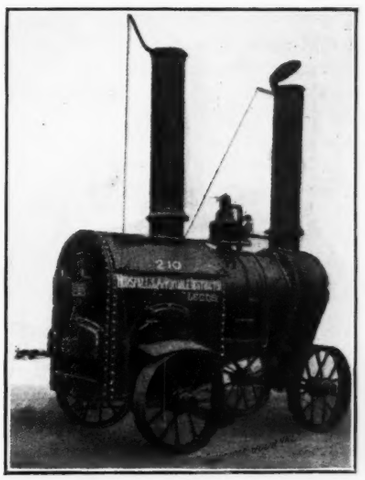


NEW ENGLISH STREET CLEANER

"Immediately in front of the brush is an inclined plate, the rear edge of which touches, or almost touches, the ground, and a series of troughs or buckets mounted upon an endless chain passes up from beneath the front of the inclined plate, and collect the material thrown over the plate by the brush. The endless chain moves in the direction required to carry the buckets upward, and then passes over the pulleys or guide wheels at the top, where the buckets are inverted to discharge their contents into a large receptacle beneath. The buckets and chain are preferably enclosed within a suitable casing to prevent the material being blown about, and the buckets or carriers are of such a form that there is no possibility of the material escaping between them during the process of filling. The complete cart, as shown in our illustration, weighs 20 cwt., and will carry an equal weight of refuse. When the van is full, the attendant need but open a door fitted in its side, and the material will roll out, due to the sloping construction of the floor. For the operation of this machine one man and a horse only are necessary, and it will do the work of eleven men and two horses with the existing methods. The price of the vehicle will probably come at about £200."

A Portable Destructor

An English firm has recently constructed and put on the market a portable refuse destructor, which has been specially designed to meet the requirements of districts which are too thinly populated to justify the expense of a destructor of a larger size, and also for camps and similar purposes. As will be seen from the illustration, the destructor externally bears some resemblance to the ordinary portable engine. It consists essentially of three parts:



PORTABLE DESTRUCTOR

(1) The destructor furnace proper.

(2) The boiler.

(3) The smoke box, containing dust catching arrangements.

The furnace is, in general principle, similar to the well-known "Horsfall" destructor, on a smaller scale.

It has an arched fire-brick top with an opening at the front for the clinkering door.

For the escape of the products of combustion the furnace is provided with the Horsfall Company's patent steam jet forced draught apparatus and side air boxes, which heat the blast and protect the furnace sides from the clinker. The furnace is provided with a by-pass, in the form of an independent chimney, for use when the whole of the heat generated cannot be utilized in the boiler.

The boiler is of the multitubular type, and is provided with the usual valves and other mountings. It supplies steam to the steam jet blowers, and is also provided with a junction valve, to which could be coupled the steam pipe of an engine for doing any useful work about a town's yard.

The dust-catcher and the smoke-box is of an ingenious type, by which the current of gas is forced downwards, so that the dust is thrown upon the floor of the chamber. A steam jet is provided in the chimney to induce the draught when required.

The destructor carries its own water tank and injector. It can be easily moved from place to place by two or three horses, or a traction engine or steam roller. It can easily burn four tons of refuse in a working day. A smaller and lighter machine can be provided for special cases.

This destructor requires no buildings, foundations, approach roadway, or high chimney. It works without any nuisance, and is easily attended to by one man.

The makers are the Horsfall Destructor Company, Limited, Leeds.

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The Plague in San Francisco

THERE has been considerable uneasiness in the public mind over the reported presence of the bubonic plague in San Francisco. The recent exaggerated statement in the New York *Evening Post*, relative to the number of cases and deaths from this dreaded disease, while it was probably unintentional, had considerable to do in increasing the fear. The paragraph was otherwise misinforming as to the true situation, for it gave the public to understand that there was so much friction between the state and civic health authorities and the Federal government, as to almost make it impossible to successfully cope with the plague. It might be inferred, indeed, that the health of the country was imperilled by the almost criminal carelessness of all the authorities who had anything to do with the plague situation in San Francisco. We did not share in this view of the situation and therefore asked for an explanation from the Board of Health of San Francisco, and the President, John M. Williamson, M. D., replied to our query as follows:

"I will state unreservedly that the figures quoted by you as appearing in the New York *Evening Post* have been, through some cause unknown to this department, ridiculously exaggerated. Your own assertion to the effect that 'the *Post's* statement is not credible,' is entirely correct. The figures published in the U. S. Public Health and Marine Hospital Reports are identical with those on record in the Department of Public Health of this city, as all investigation of plague cases are conducted conjointly by Federal and local officers.

"The most probable explanation for the appearance of the figures '2233' in connection with the number of deaths from plague in San Francisco is that some person in making the statement, 'Since February 22, 33 cases have occurred' has accidentally omitted the comma which belongs between the numerals of the date and those of the cases, so that the sentence has passed into print reading, 'Since February 2233 cases have occurred.'

"The actual number of cases of plague known to this department as having occurred since the discovery of the first case, March 6, 1900, is 89. The situation has not at any time appeared particularly acute. There have been intervals of two or three months during the past two years when no cases have been found; for instance, the case of February 22, already referred to, was preceded by one on December 12, 1901, and followed by another on April 20. In June, of this year, no cases were found.

"The attacks of the local press and the opposition of the Governor of the State, as well as the State Board of Health, have been potent factors in harassing the municipal authorities and interfering with their efforts in handling the proposition in the most effective manner. If the proper support were accorded the San Francisco Board of Health by the State authorities, the daily press and the mercantile community, there would be little occasion for alarm. As it is, the close watch upon the infected district maintained by the Federal officers and the prompt disinfection of infected premises by this department, have no doubt held the disease in check."

While the situation is neither so serious nor so critical as might appear from the bare statement that there have been 89 deaths since the first case, nevertheless we belive that immediate action should be taken on the part of the Federal Government to sustain the efforts of the San Francisco Board of Health by eliminating the opposition of tne Governor and the State Board of Health. The attitude of these officials is little short of criminal, for if they had their way the health of the whole country would be imperilled. The civic health authorities are to be warmly commended for their constant watchfulness.

The Voting Machine in the Last Election

MACHINE voting is steadily growing in favor. Wherever the people want an honest election they are anxious to have the voting machine, and wherever it is not wanted you can rest pretty well satisfied that it is because an "honest count" would not be conducive to party success. It is not difficult to determine why the voting machine is not wanted by Tammany Hall nor by the party in power in Philadelphia. Notwithstanding the strong opposition which comes from this unwholesome class of citizens, public sentiment grows apace in favor of the machine which records the will of the voter, accurately sums up the result and absolutely prevents juggling with the returns.

The voting machine was used in the principal cities of New York and in many of the smaller ones, at the last election, and gave more universal satisfaction than the old form of ballot, and to its superiority over the old system the editor can testify as he had the pleasure of using it in his district.

"Wherever in Rensselaer county the voting machines were used," said the Troy *Record*, "citizens expressed their liking for the device, and the work performed by it for the voters was gratifying in all respects. * * * As an experiment the use of the machine in this county was a success, and the places which tried the new method of voting will be found heartily endorsing the change from this time forth." "The use of the voting machine," says the Nashville *American*, "saves time and money, and is a protection against fraud. It ought to be used in all large places."

In Milwaukee, where seven of the machines were used for the first time, *The Sentinel* remarks: "The voting machines proved a perfect success in the election. * * * Rapidity and accuracy were the chief characteristics noted by the election officials, and the ease with which the voting proceeded during the day led all who watched the machines work to express themselves in terms of the highest praise. * * * One precinct has a large and almost exclusive Polish vote and yet there was far less trouble here than under the old system."

The machine is wanted in many states. New Jersey is more than likely to pass a law at the next session of the Legislature authorizing its use and Indiana, as well as other states, is looking in the same direction. Our contemporary, the Indianapolis *News*, has gone so far in its investigation of the subject as to figure out how much the State would save if it were to adopt the use of the voting machine. According to its figures the recent election cost the State the pretty sum of $262,384, whereas the total cost of the election, if machines had been used instead of the present system of voting, would have amounted to only $105,522, so that it has been actually demonstrated that the machines would pay for themselves in five or six elections.

There is little doubt, in most minds, that the machine has come to stay. At any rate, the people who use it are better satisfied with it than the old system.

American Public Health Association

There is no national organization which has had a more beneficent influence upon the development of American cities than the American Public Health Association, which will hold its thirtieth annual session at New Orleans, beginning December 8th and continuing five days.

Secretary Charles A. Probst writes that the following topics will be discussed: (1) "The Pollution of Public Water Supplies," (2) "The Disposal of Refuse Material," (3) "Animal Diseases and Animal Food," (4) "Car, Steamship and Steamboat Sanitation," (5) "Etiology of Yellow Fever," (6) "Demography and Statistics in Their Sanitary Relation," (7) "Cause, Prevention, Period of Incubation and Duration of Infectious Diseases," (8) "Public Health Legislation," (9) "Cause and Prevention of Infant Mortality," (10) "Disinfectants and Disinfection," (11) "National Leper Homes," (12) "Dangers to the Public Health from Illuminating and Fuel Gas," (13) "Transportation of Diseased Tissue by Mail," (14) "The Teaching of Hygiene and Granting of Diploma of Doctor of Public Health," (15) "Sanitary Aid Societies," (16) "The Relative Immunizing Value of Human and Bovine Vaccine Virus," (17) "The Investigation of the Canteen System of the United States Army."

Dr. C. P. Wilkinson, 1402 Peters Avenue, New Orleans, is Chairman of the Local Committee of Arrangements. The headquarters of the Executive Committee will be at the New St. Charles Hotel, a meeting of which will be held in the hotel parlor on Monday, December 8th, at ten A.M.

We are informed by the proprietors of the New St. Charles that suitable accommodations may be obtained by delegates at from $4 per day upward on the American plan, and $2 per day on the European plan, according to the size, location, etc., of the room. As New Orleans has many visitors during the winter season, it is advisable for members to engage quarters at an early date. This may be done by addressing the Chairman of the Local Committee. Members, on arriving, should go direct to headquarters, where they will receive any desired assistance or information.

The Influence and Use of Public Beauty

PUBLIC beauty as an influence for higher civic standards; the utilization of parks and park life to the same end and a larger and more intelligent use of schools and schoolyards, as factors in the development of a larger and more wholesome communal life, may be said to be the dominant purposes of the American Park and Outdoor Art Association. A special session of the last meeting of this growing association was devoted to school gardens and the work reported as having been accomplished or inaugurated along these lines was as remarkable as it was encouraging. A committee to carry forward the work has been formed and has aggressively entered on its duties. In the striking paper on "Park Life," by President Eliot, of Harvard, he says, "The problem I asked you to consider is how to secure better popular utilization of public squares, gardens, parkways and parks of the United States. One indispensable condition for their adequate use is security against violence and even against annoyances, or the sight of rude and disorderly conduct, to the end that the park may be widely used by men and women and their families, as are the parks abroad. To be of the largest usefulness the parks must be convenient of access. At the park and beach, men and women can lift up their eyes to the hills and skies and come face to face with some of the endless varieties of beauty of color, form and texture with which the surface of the earth is decked. It is then for the elevation of human nature on its every side that the better utilization of public reservation is to be urged. It has been the lot of the present generation to select for the urban populations of the present and the future many of these great treasures. It will be for future generations to maintain, enlarge and develop among the people a greater power of enjoying them."

This idea may be said to be the keynote of the Association, the Women's Auxiliary having chosen for its motto or legend, the injunction, "to leave the world more beautiful than you found it."

The new President of the Association, Clinton Rogers Woodruff, maintained in his inaugural that, "Beauty, of course, can be materially aided and helped by the few—by the aristocrats, but to be enduring and effective in the best sense of those terms, it must be democratic not aristocratic, and the success of the latter day movement for public beauty is without doubt due to its democratic tendency,—to the effort to make it of the largest value and pleasure to the greatest number. In this way it will prove a great factor in producing a readjustment along higher lines and therefore a great and essential factor in the movement for better city government just as the latter through its insistence upon higher standards and its inculcation of the doctrine of the highest public welfare is making for the former."

To democratize and municipalize art is another aim of the Association and the success which has attended its efforts in this direction has been highly gratifying, as has been its efforts to bring the various national societies interested along the same general lines into closer harmony and affiliation. Possibly a national federation with numerous departments, along the lines of the American Association for the Advancement of Science, may be formed as a result. This is certainly a wise and greatly needed move in the right direction. There is too much dissipation of energy and duplication of effort because of the multiplicity of societies and organization, and if the American Park and Outdoor Art Association can form one harmonious and effective federation out of the numerous smaller bodies, which are in some instances striving to eke out an existence, it will have accomplished a great purpose.

EDITORIAL COMMENT

It has become dangerous for municipal looters to ply their trade in some cities, St. Louis, for instance. What a pity Circuit Attorney Folk, who is so thoroughly cleaning this western city, cannot be transferred to Philadelphia.

That citizen makes a fatal mistake, who, by proffered benefits of any sort—even a drink or a cigar—tries to get on "the right side" of the public official. He thereby inculcates the spirit of avarice and promotes civic blackmail and robbery. His motive may be right, but his example and practice are wrong.

Secretary J. M. Diven, Elmira, N. Y., writes that the Association is short on American Water Works Association Proceedings for the years, 1893, 1894 and 1900, and that he would be pleased to pay one dollar for a few copies of each. Members having spare copies of these years will confer a favor by reporting to the Secretary.

Mr. J. Pierpont Morgan has failed in his effort to unite the various electric transportation companies of London. One of our London contemporaries in commenting upon the matter assigns as a reason that "in poaching upon British preserves the British financiers have fallen out among themselves or with their British confederates." Capital is making such encroachments upon the rights of the people that cities will soon have to combine in order to save any privileges for themselves.

Municipal ownership comes high in Massachusetts cities. For instance, it has taken four years and cost $250,000 to value Holyoke's $700,000 water works system preparatory to its purchase by the city. In spite of the fancy price the city is likely to buy, as it believes it a good investment. As an evidence of the unlimited cheek and greed of corporations, the company, which had received its franchise for nothing, wished to charge a good round sum for it in reselling it to the city. No wonder the private ownership of public utilities grows more unpopular. The Massachusetts law is defective and needs mending.

According to the State Board of Tax Commissioners, outside of New York City, taxes have been paid upon fully eighty per cent. of the special franchises valuations made in 1900 under the Ford franchise tax law. "In rural counties," say the Commissioners, "where tax-

paying has become a patriotic practice, payment has been made upon these assessments, almost without exception, without quibble or protest." Apparently the only unpatriotic corporations in the state are the rich ones located in New York City. This practice is anything but creditable and is sure to make them still more unpopular. It is to be hoped that a day of reckoning will speedily come for these same corporations, for they are altogether too grasping.

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Many corporations and merchants are finding fault with New York's reform administration because they are obliged to obey many ordinances, which, under Tammany rule they disregarded because it was more profitable for them to pay the ten or more dollars per month for bribery. Then, the public suffered the inconvenience; now, the public is saved from annoyance while the bribers suffer because they cannot find bribe-takers. These people, of course, do not realize that they are not only demoralizing the public service but are also guilty of criminal bribery. If such citizens were law abiding there would be fewer lapses in official honesty. What is true of New York is true of most communities. There are, doubtless, more bribes offered than asked.

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Many municipalities in Europe realize an annual revenue of considerable size from advertising signs. They hold a monopoly in the business and charge reasonable rates per square foot, for either long or short periods. They utilize public property for public purposes. And why not? This practice should be generally adopted in this country and we are pleased to notice that the authorities of St. Paul have recently framed an ordinance designed to reduce the bill-board nuisance. It provides that bill-boards shall be located ten feet back from the sidewalk and that the city shall be protected from damage suits by a bond. It further prohibits the erection of bill-boards in residential sections. The city should follow the European practice and erect its own bill-boards, prohibiting all others, and thus add another source of revenue.

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For the past ten years street sprinkling in the city of New York has been done by private contract. The contract expires next March and Street Cleaning Commissioner Woodbury does not propose to renew it. He has a plan for having the work done by the city. He maintains that it will be much more satisfactory, as there has been a great amount of fault found with the work of the private company, for no effort has been made to remove the slimy mud which is formed by the sprinkling. The Commissioner's plan is to wash the pavements, afterward drying them by the use of rubber squeegees, as in Paris. This method would remove the slippery slime, and make the pavement so clean that it would afford a fine foothold for horses. It would cost $161.830 to equip the plant and $197,480 a year to operate it, if the city is to do its own street sprinkling. The squeegee has been used with results not altogether satisfactory.

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Every city, town, village and county, should own one or more road rollers suitable for construction and maintenance work upon macadam, gravel, or dirt roads. The policy of most municipalities and counties is too niggardly. They do not seem to appreciate the value of the road roller. Every macadam, gravel or dirt road should be thoroughly rolled at least twice a year. We are way behind the practice that obtains in municipalities on the other side of the Atlantic. France spends over $30,000,000 a year in constructing and maintaining her highways, and proportionate amounts are spent in every progressive nation of the Old World. Even old Ireland sets us an example worthy of imitation. For instance, during the past two years over twenty-one miles in County Tipperary have been rolled with a steam roller at an expenditure of $19,353. The County Surveyor estimates the cost of maintaining the steam rolled roads for five years, as compared with the actual cost of maintaining the same roads under the old system, in one district at $23 per thousand linear yards as compared with $33 under the old system. Where the road roller is used the roads are kept in most excellent condition, whereas under the former system the condition is very unsatisfactory. More money should be invested in road rollers.

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A private corporation has applied to the civic authorities of Rochester, N. Y., for the privilege of entering the city with a new system of water mains, pumping its supply from Lake Ontario, eight miles north. It declares, of course, that it has no intention of competing with the municipal plant already established, except among the large consumers, and that it will be a real benefit to the city. Bosh! Does anyone think that would be its opinion if the situation were reversed and the city asked the privilege of building a second system? There are numerous cases on record where civic authorities have been permanently enjoined by private water companies from constructing a second system on any pretense, The city of Rochester owns a good water works system, and has a clear field, and there is no reason why it should permit competition. It would be worse than folly to do so. Happily for the city, the Mayor opposes the proposition, and it is to be hoped he may be strengthened and sustained in his attitude by the majority of the citizens. We believe the price of water to manufacturers should be reduced, however, from fourteen cents. That is an exorbitant price, and we only wonder that the manufacturers of Rochester have not demanded a reduction of this rate before. The city could better afford to reduce the rate than to permit another system to enter its limits.

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THE views of an English fire chief upon conditions in American cities, which are given elsewhere in this issue, are interesting and valuable. He calls attention to the enormous expenditures for fire protection in American cities as compared with those of England. "This is accounted for," he says, "by the very great risks to be provided for, owing to defective building construction, to the abnormally high salaries paid to the members, to the extensive apparatus, for which high prices are paid, and also for the magnitude of the fire alarm systems which necessitate a large staff of skilled workmen to maintain them." The Chief expressed the belief that "America could better profit by imitating English building methods than English cities could by duplicating American fire equipments." We are justly proud of our fire-fighters; they are the best in the world. They are well trained and efficient, courageous and fearless, and we do not begrudge them the salaries they receive. Many of them are underpaid, and none, in our estimation, receives too much when the hazard of his occupation is taken into consideration. We have called attention many times to the need of more stringent building regulations. The English Chief is correct in his criticism of prevailing methods in American cities. We are altogether too lax in this particular. More sensible building laws would reduce the size of the annual ash heap very materially. This is a matter which should be discussed by every civic legislative body in the United States.

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Municipal art will become more popular so soon as its advocates and promoters become more practical in their notions. This will apply not only to the individual but to the several hundred local and national associations which have for their chief object the creation of the city beautiful. Happily for the cause, many of them are sensible and do not despise the day of small beginnings nor disdain to stoop to things of low degree. The first step in beautifying a city is in making it clean. Of course, to have street lamps, electroliers, trolley poles, and other street fixtures, all of an artistic design, would add so much to the beauty of the street, but if the street itself were covered with slime and mud, and littered with refuse, it would materially detract, if not altogether spoil, the artistic effect. A dirty, filthy house, is made none the less offensive because of its rich decorations, beautiful statuary and paintings, and costly furniture. Filth is never artistic and it should not be attempted to have civic art precede cleanliness. Many American cities are notoriously dirty, and unfortunately there are many members of its various societies who think it beneath their dignity as civic art promoters, to even notice the dirt, much less make an intelligent effort to have conditions bettered. We believe that the city beautiful would sooner be realized if these members were to concern themselves more earnestly in an effort to promote good municipal housekeeping. The problems of how to lay good pavements and keep them clean, how to collect and dispose of the waste of a city, how to perfect sanitary arrangements, are more necessary of immediate solution. This is a case of where "The longest way round is the shortest way home;" that is, the way to achieve municipal art is to promote municipal cleanliness.

According to the last report of the Supervisor of City Lighting, there are 62,512 poles, including trolley poles, in the streets and alleys of St. Louis, carrying 985,913 miles of wire, exclusive of trolley lines, there being 361,896 miles of the latter, and about 300 miles of high-tension wire of the electric light and power companies. The city has made an attempt to get rid of some of the overhead wires, but, "within the past year," remarks our esteemed contemporary, the St. Louis *Republic*, "some of the authorities seem to have been indifferent concerning the stringing of wires in the conduit district. Possibly conditions were such in the isolated instances of erection of overhead wires that connivance at violations of the letter of the law could not have been prevented. It is fair to presume, though, that efforts should be made to correct conditions that were not satisfactory, or to have the existing law amended, if necessary, as a temporary proceeding.

"The conduit extension question is one that cannot be dismissed lightly. From an aesthetic standpoint the huge poles, with their networks of wire, are unsightly. From a public safety standpoint the high-tension wires which remain overhead are dangerous.

"The growth of the city and the expansion of business show the necessity for a general system covering all features of the subject, and that establishment of new boundaries that will include public places where poles and wires are a public nuisance on account of their number. The board should take this matter under consideration, discuss it thoroughly and take some positive action."

All wires within city limits should go underground, first within the business section and next in the residence district. There is an increasing demand and need for this reform in all municipalities.

LETTERS TO THE EDITOR

Information About Electric Lighting

CLEVELAND, O., October 29, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Do you know where I can find, in your Journal, or elsewhere, any recent comparisons of the cost of arc lighting per lamp in the largest cities of the United States? For example, places of over 30,000 population?

EDWARD W. BEMIS,
Superintendent of Water Works.

By referring to "The Cost of Lighting Large Cities," and "Successful Municipal Lighting," page 227, November issue, you will find references to the principal articles we have published in the last two years.—[Editor.

Revenue from Ford Franchise Tax Law

KANSAS CITY, Mo., Oct. 30, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I am interested in obtaining the statistics showing the operation of the so-called Ford Franchise Tax Law, enacted by the General Assembly of New York during the administration of Governor Roosevelt, as follows:

What was the amount of increase in the taxable property of the State on acount of the enactment of this law? I would like to know the assessed valuation of all property in the State for the year prior to the passage of the law and the increase for the first year after the law was in effect. If possible, I would like to know the amount of increase of the principal railroad systems of the State by reason of taxing their franchises.

Thanking you in advance for the above information,

F. W. FLEMING.

The State Board of Tax Commissioners give the following answer to the above questions: "The assessed valuation of all property, real and personal, subject to assessment locally for all purposes in the State for the year 1899, prior to the passage of the Ford Franchise Law, was $5,461,302,752. The aggregate of special franchise valuation made by this Board under the law for the year 1900, the first year of its operation, was $266,202,759. The assessment of tangible property, included in the special franchise valuations, made for the year prior to the passage of the law, was $97,502,996, making an increase of $166,699,763. A portion of this amount is partially estimated, for the reason that prior to the franchise law the tangible property of corporations located within the streets and that outside the streets were assessed together and the valuation of the amount located within the streets is in some instances necessarily estimated.

"The increase of assessments in the principal railroad systems for the same year were as follows:

Metropolitan	$47,262,317
Third Avenue System	14,519,251
Brooklyn Rapid Transit System	11,782,669"

The increased valuations, as per the requirements of the Ford Franchise Tax Law have been contested by the leading corporations in New York and other large cities. Many of the smaller corporations have not raised any questions, but have paid the franchise tax without protest. The tax commissioners state that, outside of New York City, taxes have been paid upon fully 80 per cent. of the special franchise valuations made in 1900. It is only the large corporations, such as the Metropolitan, Brooklyn Rapid Transit, Manhattan Elevated, and the like, strong and powerful, which are unpatriotic enough to resist the payment of this tax, which is considered by a very large majority of corporations throughout the State, to be just. I believe that the State will win in the fight, although it may stretch out over a period of years. December 2nd has been fixed by the Appellate Division of the Superior Court for the hearing of the arguments in the case growing out of the appeal made by the New York City corporations.

By addressing the State Board of Tax Commissioners, Albany, N. Y., you can secure a copy of the last annual report of the commissioners, for the asking.—[Editor.

An Electrolysis Ordinance

ATLANTIC CITY, N. J., Nov. 25, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I am sending a copy of an Electrolysis Ordinance, passed without opposition by our Council last night.

It was prepared in anticipation of the construction of a new trolley road, the franchise for which has just been granted, but applies as well to the lines now under operation.

It was not deemed best to prescribe the means to be adopted in order to prevent electrolysis, but to frame the ordinance so as to place the responsibility for the result entirely with the railway company; and the requirements are sufficiently severe as to enable the city to demand the adoption of the double trolley system should dangerous electrolytic action not be otherwise eliminated.

The railway company is also made directly responsible for damage resulting from leakage of current from its circuit.

WATER DEPARTMENT OF ATLANTIC CITY,
KENNETH ALLEN, *Engr. and Supt.*

As this, so far as we are informed, is the first ordinance of its kind, we publish it in full, as follows:

"An Ordinance to prevent damage to water mains, service pipes and other metallic structures by electrolysis caused by the operation of street railways.

"Section 1. Be it Ordained by the City Council of Atlantic City, N. J.: That any company or individual operating a street railway within the limits of the city of Atlantic City., N. J., shall, on or before February 1st, 1903, take adequate measures to completely prevent injury to water mains, service pipes and other metallic structures on account of electrolysis, and shall file with the Water Department of said city, details of the plans adopted to accomplish this result. In the case of new lines of track, such plans shall be filed before construction is commenced.

"In no case will bonding to the water mains or other conductors, not provided for the express purpose, be allowed in order to equalize the potential between such conductor and the rail, but means must be taken by furnishing and insulating a complete metallic circuit both inside and outside of city limits, to effectually prevent leakage of current from the wires or rails of the railway.

"The company or individual operating the street railway may select the particular method of securing this protection and will be held responsible only for the result.

"Section 2. Be it further ordained, that any company or individual operating a street railway within the limits of the city of Atlantic City, N. J., shall so confine its current to the metallic return circuit which it shall provide, as to comply with the following conditions:

"(a) The maximum difference in potential between any part of the metallic return circuit and any water or service pipe, or other metal conductor not intended as a part of such return circuit, shall not at any time exceed ¼ volt.

"(b) The difference in potential between any two points upon said metallic return circuit within a distance of 200 feet from each other, shall not at any time exceed ¼ volt.

"(c) The current passing along any water or service pipes or other metallic conductor not intended as a part of said return circuit shall not, at any given time and point, exceed one ampere.

"Section 3. Be it further ordained, that in February and August of each year, a test shall be made for the purpose of detecting the passage of stray currents in the ground, and between the metallic circuit of the railway and the water and service pipes and other metallic conductors liable to be effected thereby.

"The test shall be conducted by an expert to be agreed upon by the company or individual operating the railway and the Engineer and Superintendent of the Water Department. On failure to agree on an expert the test shall be made by the City Electrician.

"The expert making the test, shall present a written report of his finding in full to the Engineer and Superintendent of the Water Department, and to the company or individual operating the street railway.

"Section 4. Be it further ordained, that whenever it can be shown that damage to water or service pipes, or other metallic conductors, has been caused by electrolysis due to the operation of a street railway, notice shall be served the company or individual operating the same, by the Engineer and Superintendent of the Water Department, and the said company or individual will be held responsible therefor, and subject to damages amounting to the cost to the Water Department of discovering and repairing the injury.

"Failure to effectually remedy the cause of the injury without delay shall constitute a violation of this ordinance.

"Section 5. Be it further ordained, that any company or individual who violates the terms of this ordinance, or refuses to comply therewith, shall, upon conviction of said violation, failure, neglect or refusal to comply, be subject to a fine of not less than fifty ($50) dollars and not more than two hundred ($200) dollars and the costs of prosecution; and such company or individual shall be deemed guilty of a separate and distinct offence for every day during which such company or individual violates, fails, neglects or refuses to comply with any or all of the requirements of this ordinance.

"And the payment of such penalty shall in no way release the said corporation or individual from obligation to make compensation in full for damage done, heretofore or hereafter, to water or service pipes or other metallic conductors by reason of the escape of electric currents from the wires or other appurtenances of the railway.

"Section 6. Be it further ordained, that this ordinance shall be in force and take effect from and after its passage and publication in the manner prescribed by law."

Garbage, Light, Water and Other Information

MISHAWAKA, IND., Nov. 6, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

(1) Can you put me in touch with any sources of information pertaining to the collection and disposal of garbage for small cities?

(2) Can you give me any general statistics covering the electrical and water rates of cities of from eight to ten thousand inhabitants operating their own plants?

(3) Another subject upon which we are seeking information is that of a paid fire department in cities of this class.

Any information which you can give us, or to which you may direct us will be greatly appreciated. M. W. MIX, *Mayor.*

Garbage Collection and Disposal

THE following articles upon the garbage question have appeared in the MUNICIPAL JOURNAL AND ENGINEER during the past two years and contain much information which can be easily adapted to the needs of small cities:

"Steam Power from City Waste," March, 1901, Vol. X; "Utilizing Boston's Refuse," April, 1901; "The Disposition of the Waste of Institutions," June, 1901; all by W. F. Morse, Sanitary Engineer, New York. Although the last article named is devoted to the disposition of waste for institutions, its capacity is equal to the demand of most small cities.

"Garbage Collection and Disposal," (in Lowell, Mass.) March 1901; "Garbage Disposal in Cleveland," (O.) May, 1901; "Methods of Garbage Disposal (summary of practice in twelve cities), August, 1901, Vol. XI; the same from twenty-eight cities, September, 1901; "Condition of Garbage Disposal in the United States," by M. N. Baker, New York, October, 1901; "How Grand Rapids Disposes of Its Garbage," by Dr. William De Lano, October, 1901; "How Waco Handles Its Garbage," (a short letter to the editor) October, 1901; "A Successful Garbage Disposal Plant," April, 1902, Vol. XII; "The Refuse Disposal Problem," by W. F. Goodrich, London, England, May, 1902; "Geneva's (Switzerland) Garbage System," May, 1902; "Garbage Disposal of Hamilton" (Ontario), July, 1902, Vol. XIII; "Methods of Garbage Disposal," July, 1902; "Steam from London Refuse," August, 1902; "Modern Garbage System for Newark," (N. J.) August, 1902; "Why American Garbage Crematories Fail," Nov., 1902; "New Rules for Crematories" (Portland, Oregon), Nov., 1902.

Very little information relative to garbage incineration systems has been compiled in book form. Dr. Charles V. Chapin, Providence, R. I., has compiled in book form a great deal of valuable information relative to the administration of health departments which includes, in a small way some information about the garbage collection and disposal systems of various cities of the United States. The best work that has been written upon the subject is by an English author, "Economic Disposal of Town's Refuse," by W. F. Goodrich, price $3.50.

Electric Lighting Rates

The following articles contain some of the desired information about electrical rates: "Successful Municipal Lighting," May, 1901, Vol. X; "Water and Light for Small Towns," (with table of statistics) December, 1901, Vol. XI; "Electrical Light Statistics for American Cities," January, 1902, Vol. XII; "A Successful Municipal Lighting Plant," February, 1902; "Electric Light Rates," May, 1902; "Prices of Street Arc Lighting in Massachusetts," by Alton D. Adams, May, 1902; "Cost of Electric Lights in Small Towns," May, 1902; "A Money Making Municipal Plant," by Alton D. Adams, July, 1902, Vol. XIII; "Common Sense in Street Lighting," by Edward B. Ellicott, City Electrician, Chicago, June, 1901, Vol. X; "Municipal Lighting Statistics" (many small towns included), August, 1902, Vol. XIII; "Meters Recommended by all Means," (including table of statistics relating to small cities) May, 1901, Vol. X; "Effect of Water Meters on Water Consumption," (large table) May, 1901, Vol. X.

Fire Department Information

General information upon fire departments in small cities will be found in the following articles: "Bay City's Fire Department," December, 1901, Vol. X; "Camden's Fire Department," November, 1901, Vol. XI; "An Efficient Fire Force," (Urbana, O.) November, 1901; "Binghamton's Fire Department," April, 1901, Vol. XII; "Fire Statistics in American Cities," July, 1902, Vol. XIII; "The Fire Departments of our Cities," by John H. Sirich, September, 1902, Vol. XIII; "Favors Chemical Engines," September, 1902; "Increase in Apparatus Needed" (Alliance, O.), September, 1902; "Salaries of Firemen in American Cities," November and December, 1902, Vol. XIII.—[Editor.

Sewer Systems and Sewage Disposal

BELLEFONTAINE, O., Nov. 6, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Will you kindly give me the name of an elementary work on the construction of sanitary sewers and sewage disposal, septic tank method? S. A. BUCHANAN, *City Engineer.*

From the following list of books you will be able to select the work you desire:

"SEWERAGE." The designing, construction and maintenance of sewer systems. By A. Prescott Folwell, Member American Society of Civil Engineers; Associate Professor of Municipal Engineering, Lafayette College. Fourth edition, revised and enlarged, 8vo, x + 445 pages, illustrated. Cloth, $3.00.

Contents.—Part I.—Designing. System to be employed. Sewage Disposal. Amount of Sewage. Flow in Sewers. Flushing and Ventilation. Collecting the Data. The Design. Detail Plans. Specifications, Contract, Estimate of Cost. Part II.—Construction, Preparing for Construction. Laying out the Work. Oversight and Measurement of Work. Practical Sewer Construction. Part III.—Maintenance. House Connections and Drainage. Sewer Maintenance. The Sewage-treatment problem. Prevention of Nuisance. Destruction. Tables.

"SEWAGE DISPOSAL." By Wynkoop Kiersted, C. E., Member of Am. Soc. Civil Engineers. 12mo, XIV + 182 pages, cloth, $1.25.

Contents.—Introduction. Sewerage and Sewage. Vital Process of Purification. Disposal by Dilution. Disposal of Sewage by Irrigation. Disposal of Sewage by Intermittent Filtration. Purification of Sewage by Chemical Precipitation. General Discussion.

"SEWER DESIGN." By H. N. Ogden, C. E., Associate Member American Society of Civil Engineers; Assistant Professor of Civil Engineering Cornell University. 12mo, XI + 234 pages, 54 figures, 5 plates. Cloth, $2.00.

Contents.—General Considerations. Preparatory Maps and Data. Excessive Rain Proportion Reaching the Sewers. Relation of Density to Percentage. Mathematical Formulæ. Estimating Future Population. Amount of Sewage Per Capita. Ground Water Reaching Sewers. Grades and Self-cleansing Velocities. Developments of Formulæ for Flow. Kutter's Formulæ. Sewer Diagram. Use of Diagrams. Sewer Plans. Sewer Cross-sections. Flushing. Use of Tanks.

"SEWERS AND DRAINS FOR POPULOUS DISTRICTS," by J. W. Adams. Embracing Rules and Formulae for the dimensions and construction of works of Sanitary Engineers. 8vo, cloth, $2.50.

"THE PURIFICATION OF SEWAGE," by Sidney Barwise, M. D., London. Being a brief account of the various modern biological methods of purifying sewage. With plates and diagrams. 8vo, cloth, illustrated, net, $2.50.

"THE BACTERIAL PURIFICATION OF SEWAGE," being a practical account of the various modern biological methods of purifying sewage. With plates and diagrams. 8vo, cloth, illustrated, net, $2.50.

"THE CLEANING AND SEWERAGE OF CITIES," by E. Baumeister. Adapted from the German with permission of the author. By J. M. Goodell, C. E. Second edition revised and corrected, together with an additional appendix. 8vo, cloth, illustrated, $2.00.

"SEWAGE DISPOSAL IN THE UNITED STATES," by George W. Rafter and M. N. Baker. Illustrations and Folding Plates. Third Edition, 8vo, cloth, $6.00.

"SEWAGE TREATMENT, PURIFICATION AND UTILIZATION," by J. W. Slater. A Practical Manual for the use of Corporations, Local Boards, Medical Officers of Health, Inspectors of Nuisances, Chemists, Manufacturers, Riparian Owner Engineers, and Rate-payers, 12mo, cloth, $2.25.

"THE SEPARATE SYSTEM OF SEWERAGE; ITS THEORY AND CONSTRUCTION," by Cady Staley and George S. Pierson. Third Edition, revised. With maps, plates and illustrations. 8vo, cloth, $3.00.

"SEWERAGE AND LAND DRAINAGE," by George E. Waring, Jr. Illustrated with wood-cuts in the text and full-page and folding plates. Quarto, cloth, third edition, $6.00.

"MODERN METHODS OF SEWAGE DISPOSAL FOR TOWNS, PUBLIC INSTITUTIONS AND ISOLATED HOUSES." Second edition, revised and enlarged, 260 pages, illustrated, cloth, $2.00.

"SEWERAGE AND SEWAGE PURIFICATION," by M. N. Baker. Price, 50 cents.

"THE TREATMENT OF SEWAGE," by Dr. C. Meymott Tidy. Price 50 cents.

Any of the above works can be secured through the MUNICIPAL JOURNAL AND ENGINEER at the above rates, which include prepayment of carriage to any address.—[Editor.

Wants to Put Wires Underground

SAGINAW, MICH., Nov. 14, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

This city is about to take steps to place underground all electric wires in the business portion. Advocates of the underground system must have something upon which to base their arguments for a change.

Will you kindly state whether, in your opinion, there is a serious element of danger in the ordinary stringing of wires in the central portion of a city?

What kind of underground conduit is the most desirable?

Is it profitable for a city to own the conduits, or is it better to induce private corporations to construct them, the city reserving the right to occupy certain portions free of charge?

Is it thought to be a good idea to place underground conduit construction beneath the sidewalk instead of under the street proper?

Do you know of any objection to underground conduit work from an engineering point of view? GEORGE S. CRABB,

Electrical Inspector.

In our December, 1901, issue we gave a complete description, well illustrated, of the conduit system just being completed in Baltimore, and in July, 1902, we printed an article written by Mr. F. H. Oldersnaw, City Engineer, New Britain, Conn., descriptive of a system of underground conduits established by that city. If you will refer to your file of the MUNICIPAL JOURNAL AND ENGINEER you will find these articles, but if you have not kept a file and would like to have these articles to read and refer to, they will be sent to you upon receipt of 25 cents each.

Now as to our opinion: There is a most decided danger in having a multitude of telephone, telegraph, and electric light wires above ground in the business section of any city. It is more difficult for a fire company to fight fire in the business section where the wires are strung overhead than where they are put underground. Besides, as the wires strung overhead are more poorly insulated, and often not insulated at all, there is greater danger of a high potential current getting astray and running loose on some telegraph or telephone wire, thereby doing damage to life and property. Besides all this, the wires and poles are unsightly.

By referring to the advertising pages of the MUNICIPAL JOURNAL AND ENGINEER you will find there the advertisement of several well-known vitrified conduit manufacturers, any of which will give you perfect satisfaction.

There is really but one suitable kind of underground conduit; the vitrified conduit is the one more generally used.

By all means a city should own its conduit system, because it is to be laid in the streets. We believe a city should own and construct its own conduit system, moreover, for the reason that it should receive the benefit of any profits. Besides it should retain absolute control over its streets, and if the work were assigned to a private corporation there would always be more or less friction. The tendency now-a-days is for cities to construct their own conduit systems. This is much better than to grant the laying of conduits to different and separate companies which are obliged to string wires overhead, such as for telegraph, telephone, and electric light purposes. Three corporations in a Canadian city not long ago secured the right to lay three separate conduits and after looking the ground over carefully concluded that it would be better policy for the city, or an independent company, to construct and operate the conduit, as to have three separate systems constructed in the streets would be confusing and harmful.

I know of no conduit system which is placed underneath the sidewalk. My judgment is that to construct it underneath the sidewalk would not give as good satisfaction as to place it in the street.

I know of no objection, from an engineering point of view, to underground conduit work. It is perfectly feasible, and as I have said before, it is in use in quite a number of cities. In fact, there are nearly 250 municipalities of 3,000 population and over which have some, or all, of their wires underground. It would be a mistake to have the conduit system constructed by other than the city authorities.—[Editor.

Cities Which Incinerate Garbage

BOSTON, MASS., November 2, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

We desire to obtain a list of the number of crematories or incinerator plants for the disposal of garbage and waste in the United States. The names of the systems used and where located. Can you give us this information, or direct us how to secure it?

We thank you in advance for your courtesy, and if there is any charge for the above, our cheque will be promptly forwarded.

THE AMERICAN UNDERWRITING COMPANY,
LOUIS H. SCHNEIDER, *President.*

The following is a list of the principal cities in the United States which dispose of their garbage by the incineration process. We do not know the makers of the destructor plants used in all of them, but this is information which may be readily secured by addressing the mayor of those cities from which you desire the information. This list includes towns and cities of 3,000 population and upwards, which dispose of a portion, or the whole of their garbage by cremation:

Atlantic City, N. J.; Allentown, Pa.; Atlanta, Ga.; Anderson, Ind.; Bridgeport, Conn.; Bradford, Pa.; Butler, Pa.; Benwood, W. Va.; Brunswick, Ga.; Butte, Mont.; Camden, N. J.; Coudersport, Pa.; Charlotte, N. C.; Covington, Ky.; Chicago, Ill.; Corsicana, Tex.; Dayton, O.; Des Moines, Ia.; Dallas, Tex.; East Liverpool, O.; Elwood, Ind.; Evansville, Ind.; Evanston, Ill.; Fairmont, W. Va.; Findlay, O.; Fort Wayne, Ind.; Greensboro, N. C.; Glenville, O.; Gainesville, Tex.; Hazleton, Pa.; Hamilton, O.; Helena, Mont.; Houston, Tex.; Jeanette, Pa.; Jacksonville, Fla.; Joliet, Ill.; Lowell, Mass.; Lancaster, Pa.; Lafayette, Ind.; Lincoln, Ill.; McKeesport, Pa.; Macon, Ga.; Memphis, Tenn.; Mansfield, O.; Marion, Ind.; Muncie, Ind.; Milwaukee, Wis.; Minneapolis, Minn.; Newport News, Va.; Norfolk, Va.; Oil City, Pa.; Oskaloosa, Ia.; Ogden, Utah; Portland, Ore.; Richmond, Va.; Richmond, Ind.; Scranton, Pa.; Savannah, Ga.; South Bend, Ind.; San Francisco, Cal.; Salt Lake City, Utah; Troy, N. Y.; Trenton, N. J.; Terre Haute, Ind.; Topeka, Kans.; Taylor, Tex.; Waterbury, Conn.; Wilmington, Del.; Wheeling, W. Va.; Waco, Tex.; Yonkers, N. Y.

The most commonly used are known as "The Dixon," "The Engel," "The Davis," and "The Decarie," the latter made by the Decarie Manufacturing Company, Minneapolis, Minn.; "The Morse-Boulger," made by the Morse-Boulger Destructor Company, 39 Cortlandt street, New York City.—[Editor.

Personalities

—Mayor Samuel Cole of Beverly, Mass., was recently elected State senator on the Republican ticket.

—Hon. Charles S. Ashley, Mayor of New Bedford, Mass., has received the nomination for mayor for the ninth term.

—Mr. L. C. Boardman, secretary of the New York and Chicago Road Association, delivered a lecture on "Good Roads" at Erie, Pa., on November 15.

—At the election held at Ithaca, N. Y., on November 4, the mayoralty vote was a tie between Hon. William B. Gunderman, the present mayor, Republican, and Mr. George R. Miller, Democrat, each receiving 1,682 votes.

—Mayor Robert Rohl, of Centralia, Ill., has been indicted for malfeasance in office. It was charged that, after the Council ordered the enforcement of the saloon and gambling ordinances, the Mayor set them aside and released the gamblers.

—Mayor Schmitz of San Francisco, Cal., has been making a trip across the country and has visited the larger cities. At a German political meeting in New York, His Honor entertained the meeting between speeches by playing the violin.

—Mayor Reid of Kansas City, Mo., has been holding conferences with the Board of Public Works and the president of the Electric Company looking towards a reduction in the price of arc lights. He wants the price reduced from $82.50 to at least $65 a year.

—Mr. Edward Butler, Democratic "Boss" of St. Louis, Mo., was indicted, tried and found guilty of bribery and sentenced to a term of three years in the penitentiary. Butler is one of the many politicians and officials mixed up with the bribery scandal unearthed by District Attorney Joseph Folk.

—Mr. Charles J. Cox of Clinton, Ia., has just returned from a year's tour of Europe investigating the sewerage and sewage disposal systems of France, Germany and England. He also attended the British Sanitary Congress at Manchester. He will resume active work with the Iowa Engineering Company.

—City Engineer William H. Floyd, Jr., of St. Joseph, Mo., says it is impossible to keep clean the main thoroughfares of the city as long as the side streets remain unpaved. He wants the streets adjoining the main ones to be improved so as to keep the dirt from being tracked onto the pavements of the latter.

—Mayor George of Billings, Mont., stated at a committee meeting recently that the time was ripe for the city to take up the matter of buying the present water and light system of the Billings Water Power Company. He wants the question put to the taxpayers in the spring so as to learn their attitude on the subject.

—Mr. Emil Kuichling, Engineering Editor of THE MUNICIPAL JOURNAL, is the water expert selected by the Street and Water Board of Jersey City, N. J., to assist in the proceedings brought against the Jersey City Water Company to compel it to build the proposed dyke at one end of the Boonton reservoir that is under course of construction.

—Because he was accused of agitating a strike in a cigar factory, Hon. Francisco Millan, Mayor of West Tampa, Fla., was forced to leave the city. He states that he was taken from the town in a carriage to a lonely spot, whipped, and then was shipped to Key West, being threatened with death if he should return. Friends escorted him back again.

—The Texas Court of Appeals affirmed the decision of the lower court which dismissed the injunction obtained by Mayor J. W. Riggins, of Waco, to prevent the Council of Waco from impeaching him. Mayor Riggins was accused of paying more attention to the furtherance of the whisky cause than to his official duties. It is likely that the case will be again appealed.

—As a result of a fight between Mayor Sradensack and the Council of Peru, Ill., the Mayor has been requested to refrain from performing the duties of his office while he rests under charges of accepting a bribe. The Mayor did not take kindly to this invitation, and, consequently, a coldness sprang up between His Honor and the august body. As the Mayor refuses to sign the salary vouchers, none of the officials can receive any compensation for their services.

—Alderman Mayor of Chicago, suggests that the city take title to all real estate on which the owners refuse to pay taxes. Then, when the former owners wish to sell the property or do anything with it they will be forced to consult the city. A tax buyer should be placed at all auction sales of real estate and, if nobody bid in the property, the city could perfect its title and either sell the property or compel the original owner, if he wants the property, to pay the city for its outlay and interest at 6 per cent. Thus the city would be acting as the highest bidder at these sales acts at the present time.

—At the elections held on November 4 last, the following were elected to the office of mayor in different cities: Derby, Conn., Mr. George P. Sullivan, Democrat; South Norwalk, Conn., Mr. John J. Cavanaugh, Democrat; Norwalk, Conn., Mr. Charles L. Glover, Democrat; Stamford, Conn., Mr. Charles H. Leeds, Democrat; Minneapolis, Minn., Mr. James C. Haynes, Democrat; Elizabeth, N. J., Mr. P. J. Ryan, Democrat; Newark, N. J., Mr. Henry M. Doremus, Republican; Amsterdam, N. Y., Mr. William A. Gardner, Democrat; Auburn, N. Y., Mr. Thomas M. Osborne, Democrat; Watervliet, N. Y., Mayor Hilton, Republican, re-elected; Newport, R. I., Mr. Patrick J. Boyle, Democrat; Woonsocket, R. I., Alphonse Gaulin, Jr., Republican; Saginaw, Mich, Mayor William B. Baum, Democrat, re-elected.

NEWS AND PRACTICE AMONG THE CITIES

Automobile Dump Wagons—Septic Tank Successful—Economical Inspection of Pavements—Glass Bricks for Paving—Municipal Gas Plant for Buffalo

Convention Dates

DECEMBER

The thirteenth annual meeting of the American Health Association will be held in New Orleans, La., December 8-12. Dr. Chas. O. Probst, secretary, Columbus, O.

The League of California Municipalities will meet in convention at San Jose, Cal., December 10-12.

The League of California Municipalities will meet at San Jose, Cal., December 19-21. H. A. Mason, Mills Building, San Francisco, Cal.

The Charities and Corrections State Conference is to be held at Jackson, Mich., in December. Mrs. Edward L. Knapp, Jackson, Mich.

JANUARY

The State Good Roads Convention will be held at Springfield, Mo., January 8-10. G. W. Waters, Canton, Mo.

The State Firemen's Association meets at Aurora, Ill., January 13. Walter E. Price, Champaign, Ill.

FEBRUARY

The National Brick Manufacturers' Association will hold its seventeenth annual convention at Boston, Mass., February 4-7. Theodore A. Randall, Secretary, Indianapolis, Ind.

Public Structures Turned into Billboards

LOCAL reports from Ohio state that the Muskingum County court house, for which the taxpayers paid over $600,000, has been turned into a gigantic bill-board, and the new bridge which cost over $400,000, is also used for advertising the latest brands of cigars and liquors.

New Reservoir for Rochester

AFTER considerable discussion, Commissioner of Public Works John Y. McClintock has been authorized to acquire Cobb's Hill for an additional distributing reservoir. This is one of the two reservoirs which the city desires to build, and comprises a tract of land 55 acres in extent, which will cost about $110,000. The reservoir to be built will hold about 70,000,000 gallons and its construction is estimated to cost $572,000. The engineers have been considering the construction of half of the reservoir at the present time, and the rest of it when the needs require.

Bill-board Regulation

AT the last session of Congess an Act was passed authorizing the Commissioners of the District of Columbia to collect an annual fee of $20 from the person or company engaged in bill posting. Written consent must be obtained from the Commissioners before business can be done. In addition to this, when business is done in the residence section, the written consent of the owners of a majority of the real estate in the vicinity of the bill-board must be secured. A complete list of all the places where business is done must be filed with the Commissioners and be kept corrected, and it is in the power of the Commissioners at any time to change this list for cause.

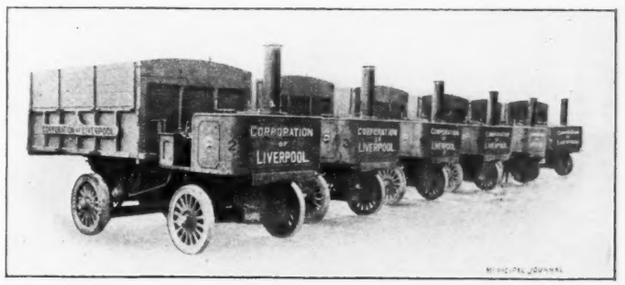
Will Remove Garbage by Trolley

A NEW method of disposing of the garbage of Savannah, Ga., has been devised by the city and the Savannah Electric Company. The company is to purchase a number of cars, designed for the transportation of garbage, and the cost of these—estimated at $14,000—will be divided equally between the city and the company. The city's wagons will cart the garbage from the different sections to the central station, where the cars will be loaded and will then be run out into the country to the county poor farm, where the garbage will be used as fertilizer. A tonnage basis will be used in charging the city for the removal of garbage, and this is estimated at about $20 per day. In addition, the city will have to operate the teams for collecting the garbage. The county will contribute about $3,000 toward the removal of the garbage, but in return will not only receive the garbage as fertilizer, but will have the right to pick it over, and have such portions of it as are marketable returned to the city free of cost.

Automobile Dump Wagons

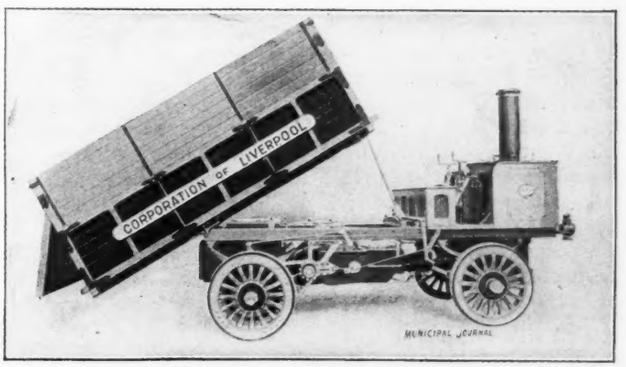
AFTER a trial extending over three years, the Corporation of Liverpool, England, has purchased six automobile dump wagons for use in the city. Each wagon has a capacity of six cubic yards and can be dumped from either side of the machine.

Cast steel has been largely adopted in the construction of the wagons so that some of the gear wheels are made in one piece with hollow shafts. Strength and durability, together with lightness, have been secured in many ways, especially in the construction of the rear axle out of Mannesmann steel tubing, and of the engine shaft



out of one solid forging, complete with its eccentric blocks, counterweights, flanges for the gear wheels, etc. The tube for the back axle is one-half inch thick, and its ends are swaged down to receive the cast steel brackets, which are shrunk on it, and which carry the springs. The front axle is steel casting made in girder form. The engine and the gearing are entirely enclosed so as to exclude any dir or other substance that might interfere with their working.

The tires, which protect the wooden wheels, are attached to them as follows: The wheel is supported horizontally, and a cold weldless steel tire of larger diameter is placed around it. A large number of hydraulic plungers are simultaneously forced radially inward from their cylinders, these cylinders being formed in an external ring of



great strength. As the plungers press equally against the periphery of the tire, the tire becomes smaller and smaller until it presses the wheel rigidly together. This method is employed because it is impossible to cool a tire of this size rapidly enough to prevent its burning the wood if an attempt is made to shrink it on in the usual way.

Economical Inspection of Pavements

In order that the Highway Department of New York may call to account the companies that are under contract to maintain the asphalt and other pavements in good condition, Street Cleaning Commissioner Woodbury has instructed his men to report upon the condition of the pavement in their several districts. This is a quick and certain method of locating the bad places in the city streets and saves the expense of a large corps of inspectors which would otherwise be required. The Commissioner expects to keep the Highway Department constantly informed as to the condition of the pavements.

♠

Municipal Heating Plant

After establishing the municipal electric lighting plant and proving that electricity can be supplied to the citizens at ten cents per thousand watts, Webster City, Iowa, has decided to maintain a municipal heating plant. Last spring a private corporation asked for a franchise to put in a gas and heating plant. The council refused the franchise, but decided to put in a plant under city control. A special election was held and the proposition carried unanimously. The mains are run through the business streets and may be tapped by business houses, and when the business warrants it, the residence portions of the city will be supplied likewise.

♠

Big Improvements in Brooklyn

There has been a remarkable improvement in Brooklyn streets during the administration of Borough President Swanstrom. For the first time in the history of the city the amount of asphalt paving exceeds one hundred miles. During the period covered by the third quarterly report, five miles of asphalt, and two miles of granite pavement were laid, while numerous streets were repaired. The Bureau of Sewers reports that nearly one-half mile of vitrified pipe sewers, 153 feet of cast-iron pipe sewer, and over a mile of brick sewers were laid. The most important work has been the preparation of the plans for the first two public baths in the borough. Bids for these baths are now being asked

♠

Glass Bricks for Paving

The glass paving brick which is being tried at Lyons, France, has stood the test fairly well. It is claimed that these bricks are more durable than granite, while they are cleaner than any other pavement. The glass stone is made from old bottles and window glass. It is crushed in a mill, sifted and slowly heated in iron molds so that the glass is devitrified and converted into a pasty mass, which is then heated for a brief time to about 1,300 C. and subjected to hydraulic pressure. Official tests show that the block will stand three times the pressure of granite, even when cooled several degrees below zero. The blocks also have a high percentage of tensile strength and resist fracture more strongly than hard quartzite.

♠

Must Install Sewage Disposal Works

Trouble has come to the city of Waterbury, Conn., because of an order of the court restraining the use of the Naugatuck River for carrying the city sewage. It behooves the city of Waterbury, consequently, to find a remedy for this trouble, and it is probable that a sewage disposal plant will be installed shortly. One proposed plan is to build a trunk sewer from the city to the Sound, but the undertaking seems too large for the city. A second plan is to build a sewage disposal plant In 1900, City Engineer Cairns was ordered to investigate the recent developments in sewage purification in England, and his report and that of Mr. Rudolph Hering, shows that the septic treatment of sewage produces the most satisfactory results.

♠

Adopts American Plan of Taxation

While many of the public utilities in Glasgow, Scotland, have been successfully undertaken by the city, the methods of taxation have not been those of the best, and a new system of taxing the land is about to be adopted. This is patterned after the American idea and consists in the special assessment plan by which a portion or all of the expense of local improvements is charged against the property directly benefitted. This method is not known in England, and Glasgow's efforts in that direction will be the first. One of the reasons why this system has been practically forced upon the local government is the fact that the steady increase in expenses has been charged exclusively on tenants while unbuilt areas have not been taxed at all.

♠

Municipal Gas Plant for Buffalo

After discussion for many months, the Board of Councilmen of Buffalo, N. Y., recently unanimously decided to erect a municipal gas plant. The aldermen have not consented to co-operate as yet, but it is likely that they will do so soon. The councilmen were asked to approve the contract for city lighting with a local gas company, which was to be done at an exorbitant price, but refused to assent to this, with the above result. A special committee which had been investigating the subject, reported that in Philadelphia a gas company lights all the streets and public buildings free of charge and pays a percentage of the gross receipts. The Council will ask the Board of Aldermen to adopt resolutions looking toward the establishment of a municipal plant.

♠

Septic Tank Successful

A new septic tank has been installed in the city of Santa Rosa, Cal., to care for the sewage of the place. The tank is 270 feet long, 18 feet wide, and eight feet deep, and is divided into two sections so that the action of each is independent of the other. After the sewage is passed through these tanks it is taken to the settling tanks, which have been in operation some time. According to the *California Municipalities*, the operation of this tank is a great success, and the effluent discharged is as pure as can be desired. The tanks are placed end to end, rather than side by side, which arrangement, it is claimed, gives much better results. Other attachments in the way of current breakers, sludge retainers, etc., are thought to add greatly to the efficiency of the tank.

♠

Municipal Rabbit Warren

In 1896 the Council of Torquay, Devonshire, England,—with a population of 33,000,—purchased the water shed to secure the purity of the water supply, but were not satisfied that the four square miles of land should lie idle. Portions of the land are devoted to hay, oats, etc., on which the horses of the city are fed, and on other parts some two hundred sheep graze. More profitable than the sheep are the rabbits which abound in all parts of the moorland. Men are employed as trappers to catch these animals, and during the last twelve months over 16,000 rabbits were sold at an average price of 13½ cents after paying all expenses. The Woodlands are preserved and about two hundred partridges were killed and sold during the year. A nursery of more than 170,000 fir and larch trees is maintained, and these also add to the yearly income. The land cost the city $500,000, but it is very probable that the returns from the industries to which it is devoted will soon wipe out this debt.

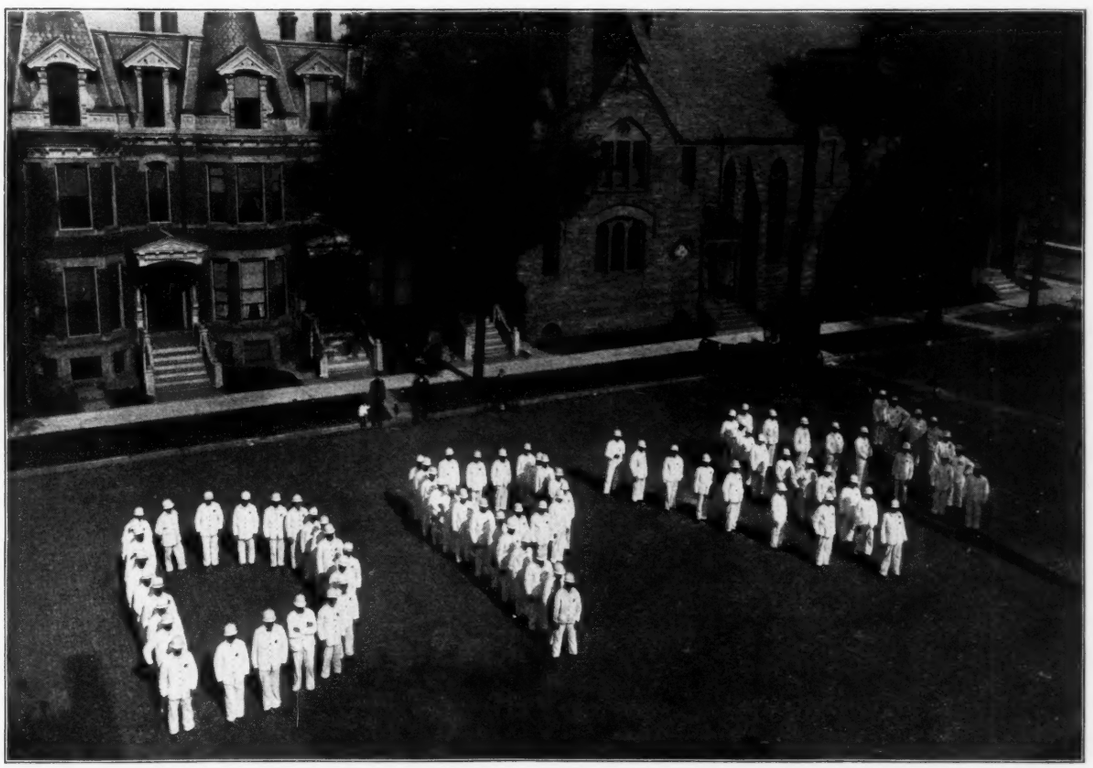
♠

Need of Water Meters in Chicago

A universal water meter system was recently adopted by the city of Springfield, Ill. The meters are to be furnished by the city and must be in operation not later than January, 1904. Such a system should be installed at Columbus, Ohio, judging from the reports concerning the great daily waste. This is placed at 4,800,000 gallons per night. This same subject has been urged by City Engineer Ericson of Chicago, who sounds a warning about the greatly increasing waste of water in the city. Mr. Ericson desires that the commissioner require all consumers to supply their services with meters. While the officials knew that a great waste was going on, the figures given by Mr. Ericson were startling: 360,000,000 gallons are pumped every day, and of this amount about three-quarters goes to waste. Only 15.25 per cent. is known to be consumed legitimately, while there is doubt as to the disposition of the remainder of the 25 per cent. Five reasons are assigned for the heavy loss: defective joints and pipes and defective house plumbing; abandoned and leaky service pipes between mains and curb walls; the opening of faucets in winter to prevent freezing, and the overflow of tanks. By the use of meters, it is claimed, that at least 50 per cent. of leakage can be prevented.

A Department That Does Things

DURING the last fiscal year, the Department of Public Works of Detroit, Mich., has been more than busy getting the city into good condition. The report of Commissioner D. W. H. Moreland shows that the total expenditures of the department were $1,247,259.51. Despite this large amount there is a balance to the credit of the appropriation fund for the coming year. During the last year some twenty-three miles of streets and alleys have been paved, of which 17.66. miles were of cedar block on concrete; 1.45 miles of brick on concrete; 1.46 miles sheet asphalt on concrete; .58 miles of block asphalt on concrete The alleys were paved with brick on concrete to the extent of 1.75 miles. The city has now 286 miles of pavement, 227.75 of which are of cedar block; 26 1/3 of brick; 25 1/3 of sheet asphalt; one mile of block asphalt, two miles of granite, and the rest of Medina stone, macadam, etc. During the year, 165½ miles of trunk sewers and 338 miles of laterals were laid, and the total amount of money spent on sewers was $108,467.22. A large item of expenditure was that for maintaining asphalt pavements on which the guarantees of the contractors had expired. During the coming year it is estimated that 210,796 square yards of asphalt paving must be cared for by the city in addition to that already looked after, and more money must be appropriated for the work. The cost of labor and materials in caring for the pavements during the past year amounted to $161,289. The legislature amended the city charter so that the building of side walks was to be paid for from a special fund and the repairing of the walks should be done by the city instead of by the property owners. This division of the Department of Public Works has grown to considerable proportions, and during the last year 48 miles of plank walk and 16 miles of stone were built. At the close of Mr. Moreland's report is attached his article on "The Gospel of Cleanliness," a paper read before the convention of the League of American Municipalities at Grand Rapids, in August, which appeared in the August number of THE MUNICIPAL JOURNAL.



DETROIT'S WELL-DRILLED STREET CLEANING DEPARTMENT

Favors Public Ownership

THE Water Committee of the Council of Memphis, Tenn., has handed in its report concerning the purchase of the plant of the Artesian Water Company. In previous issues of THE MUNICIPAL JOURNAL have appeared the city's and the company's sides of the water dispute. The financial condition of the company has never been known before, but the report shows that the company is earning 15 per cent. annually, which gives a value of at least $500,000 to the plant. The earning capacity of the company is in excess of what was supposed, and this stated value is not excessive in the estimation of the experts. The water company has a surplus of some $25,000, according to its books, but the accountant states that this surplus is at least $60,000. The expert engineers have reported that the pumps and pipes of the company are in good order and that the depreciation is only estimated and is not apparent. The machinery is up to date, and the only possible addition to be made to the plant to supply an increased population, would be a 15,000,000 gallon pump. For a certain daily output the supply of water is apparently inexhaustible.

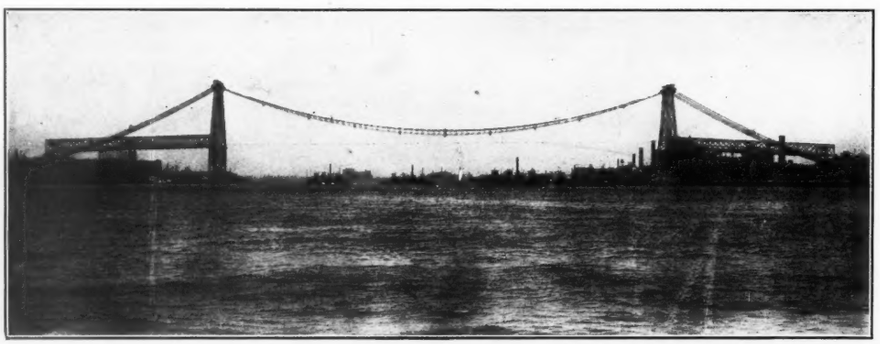
The Water Committee strongly urges municipal ownership, one reason being that of economy. It shows that the city will save $115,000 annually by the purchase. At present each fire hydrant costs $50. which would be saved to the city if it purchased the plant. The present meter system is protested against by the committee, who state that it is double what it should be. The committee opposes the erection of a new plant as unnecessary and inexpedient, and in case of purchase by the city of the present plant a water board of five members is recommended.

Objections were made by some of the councilmen and more information was desired by others. The company agrees to sell the plant to the city by delivering $1,100,000 of 6 per cent. stock for a similar amount of 5 per cent. gold bonds and the assumption by the city of a $1,250,000 mortgage. The city has obtained this option until September first, 1903.

THE NEW EAST RIVER BRIDGE

THE second link that is to bind together the old cities of New York and Brooklyn is rapidly nearing completion.

On October 28, 1896, the first contract was let for the foundations of the Manhattan tower. The work on this was begun November 7th and completed in September of the following year. The foundations for the Manhattan and Brooklyn towers together cost $858,000, and the anchorages $1,569,000. The contract for the steel towers and end spans specified that they were to cost $1,220,726.60. The price paid for the cables and suspender rods amounted to $1,407,440. The estimated cost of the structure complete is $15,000,000.



THE NEW EAST RIVER BRIDGE IN NEW YORK
Courtesy of *Automobile Topics*

This bridge will be, when finished, the longest and largest of the suspension type in the world. Between the terminals there is a space of 7,200 feet and the main span from centre to centre of the towers measures 1,600 feet. The bridge will be 118 feet wide and the roadways will be suspended 122 feet above the river. The suspended structure is estimated to weigh 7,500 tons and this, with the 4,500 tons of cables and fittings, will rest on massive steel towers rising 333 feet from the water's edge. Each of these steel towers weighs 3,000 tons and is supported on huge foundations of masonry.

In March, 1901, the connecting spans were swung into space amid the roar of boat whistles. Cables for the foot bridges were brought across the river on flat boats the following month and were raised into position April 11th. The foot bridges from which the men were to build up the cables were joined midway between the towers on June 4th. Each of the cables that is to hold up the suspended structure and the traffic that will pour back and forth over the driveways and on the railway cars, will be 2,900 feet in length. The construction of these cables is a long and tedious undertaking. To the observer below the work does not appear to make any progress, but day after day hundreds of wires are added to each cable. They are to be, when finished, 18¾ inches in diameter, and each will be made up of 7,696 strands of wire 3/16 of an inch in diameter. The total mass of wires in one cable is subdivided into separate bundles or strands and these are made up in a higher position than they are to occupy ultimately. The work of regulating the wires in a cable to the same length is a matter of great difficulty, inasmuch as there is no way of measuring except by comparing by means of observation with the first wire strung. Unlike the cables of the Brooklyn Bridge, those of this bridge will be clamped every twenty feet by cable bands with three short intermediate wrappings between. To protect the cables from atmospheric influences, they will be covered by sheet iron fitted between the bands. It is estimated that the work of finishing the cables and putting in the suspenders will occupy three months and that the bridge will be open to traffic in two years.

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SCHOOL EXPENDITURES IN TEN CITIES

		Total of enrolled pupils.	Average daily attendance.	No. Superintendents and teachers.	Average salary per capita of teachers.	Total salaries per capita, daily attendance.	Average cost maintenance per capita, daily attendance.	No. pupils attending to each teacher.	Total expenses per capita,	Total daily attendance. population.	Total expenses for school purposes.
New York (3,437,202)	1901	559,218	397,928	11,388	$1,119.02	$34.59	$41.56	34.9	$57.41	$6.64	$22,845,358
Chicago	1881	63,141	44,200	960	666.90	15.86	18.39	46.0	25.71	2.25	1,136,551
(1,698,575)	1891	146,751	108,137	3,010	763.71	23.91	29.68	35.9	37.82	3.71	4,090,480
	1901	262,738	208,081	6,021	848.13	27.56	32.12	34.5	38.05	4.66	7,929,496
Philadelphia	1881	.....	91,894	2,113	489.18	*12.39	*15.04	43.4	*15.57	*1.68	1,431,235
(1,293,697)	1891	.....	99,550	2,789	623.39	*19.00	*14.15	35.6	*29.85	*2.83	2,972,306
	1901	.....	139,632	3,672	688.85	*20.01	*23.53	38.0	*30.24	*3.34	4,223,277
St. Louis	1881	51,581	34,893	977	601.33	18.85	20.94	35.7	22.43	2.23	782,742
(575,238)	1891	59,693	41,962	1,215	587.36	19.37	22.29	34.5	29.52	2.74	1,238,900
	1901	79,274	58,128	1,684	639.38	21.37	24.76	34.5	32.20	3.25	1,872,223
Boston	1881	.....	45,079	1,128	981.14	*26.81	*33.71	39.9	*39.37	4.89	1,775,037
(560,892)	1891	.....	54,858	1,396	902.01	*26.92	*34.41	39.2	*38.67	4.73	2,121,744
	1901	.....	73,770	2,002	1,065.60	*31.77	*39.13	36.8	*50.35	6.62	3,714,466
Cleveland	1881	24,836	17,016	449	640.23	18.65	20.96	37.9	24.69	2.62	420,219
(381,768)	1891	38,314	28,462	785	649.75	20.32	23.32	36.2	37.17	4.04	1,057,978
	1901	59,635	46,009	1,304	759.10	24.30	28.90	35.2	42.03	5.06	1,933,765
Cincinnati	1881	33,770	26,244	650	822.11	20.79	.....	40.3	25.63	2.63	672,878
(325,902)	1891	36,900	29,099	760	809.40	21.63	.....	38.2	26.71	2.61	777,258
	1901	44,285	35,544	955	837.87	24.20	.....	37.2	29.93	3.26	1,064,047
New Orleans	1881	20,000	14,566	403	483.94	14.39	15.83	36.1	15.84	1.06	230,784
(287,104)	1891	22,709	15,932	474	410.91	13.27	14.70	33.6	15.00	0.98	238,992
	1901	31,547	22,683	787	473.41	17.81	21.34	28.8	21.57	1.70	489,480
Detroit	1881	16,158	11,429	259	986.62	24.93	.....	44.1	33.84	3.32	386,823
(285,704)	1891	25,087	18,402	526	637.37	20.55	.....	34.9	31.09	2.77	572,148
	1901	40,303	30,864	932	702.61	23.92	.....	33.1	40.55	4.38	1,251,825
Washington	1891	38,386	29,010	795	691.21	20.50	23.54	36.4	31.66	3.98	918,667
(278,178)	1901	47,431	36,672	1,286	682.03	25.95	32.21	28.5	40.51	5.33	1,485,694

* Per capita average based on average daily attendance. Population figures for 1900 given in parentheses under city name.

MEETING OF THE MUNICIPAL LEAGUE

THE seventh annual meeting of the Kansas Municipal League was held at Leavenworth November 13 and 14, with about thirty delegates from different cities of the first class in attendance. After the preliminaries of opening the session, Mr. M. A. Preybylowitz, City Clerk of Leavenworth, was elected secretary and the announcement of his name created quite a commotion in the assemblage. The main part of the sessions was devoted to the consideration and passage of the proposed bill of ex-City Attorney W. A. S. Bird of Topeka, providing for a revision of the charters of all cities of the first class. Some of the accepted provisions of this bill were as follows: No one shall be eligible to office unless he has been a resident of the city for six months, instead of thirty days as at present; that the mayor and council have control of bill-boards and the scattering of handbills; regulating the planting of shade trees; facilitating the addition of property to the city; authorizing the construction of garbage crematories; permitting the councils to fix a maximum rate to be charged corporations holding public franchises and providing for true reports of the receipts and expenses of said corporations, in case false reports are rendered, the corporation to lose the revenues for the period covered by the false report; requiring that all wires shall be placed underground; power to cities to repair dangerous buildings at the expense of the owners; increasing the city attorney's salary to $2,000 and that of the city treasurer to $1,200; making it unlawful for any city official to be engaged in litigation adverse to the city on pain of loss of position; making thirty days the limit of time in which to file injunction suits against special assessment ordinances; providing for the levying of a special license tax on all telephone, electric railway or other poles in a city; providing that no action shall be sustained by any one for damages received in any accident unless such one shall, within thirty days thereafter, have filed a statement with the city clerk giving the circumstances and the names of witnesses and providing that owners of abutting property or corporations doing repairing to the streets be held pointly liable with the city. This bill is to be presented to the next legislature and its passage will be pushed.

The next meeting of the League will be held at Wichita in 1903, and because of Secretary Bird's devotion to the interests of the League he was elected permanent secretary for an unlimited time. All sessions of the League are open to citizens interested in the laws discussed by the League and their attendance is cordially invited.

MUNICIPAL TAXATION IN UNITED STATES

In Fifty-One Cities Ranging in Population from 60,000 to 300,00—Compiled By Andrew Rosewater, M. Am. Soc. C. E., City Engineer, Omaha, Neb.

City.	Population, 1900.	Area, square miles.	Assessed valuation.	Tax per $100 as assessed.	Amount of tax.	Rate of tax per capita.	Real value per capita.	Rate per $100 real value.	Annual expense for street cleaning and sweeping.	Cost of cleaning and sweeping per capita.	Miles of paved streets.	Average width between curbs.	Sweeping and cleaning, cost per mile.	Cost of clean. & sweep. per mile on basis of 45 feet width.
Albany, N. Y.....	94,151	10.73	$65,073,275	$1.90	$1,239,027	$13.16	$691	$1.90	$42,402	$0.45	80.92	30	$524	$633
Allegheny, Pa.	129,896	8.00	82,500,000	1.76	1,448,549	11.15	705	1.58	45,000	0.35	84.04	30	535	802
Atlanta, Ga.	89,872	11.00	53,177,717	1.45	771,076	8.58	819	1.05	.....	...	63.00	..	....	....
Bridgeport, Conn...	70,996	13.40	62,906,222	1.30	817,781	11.52	886	1.30	23,917	0.34	4.75	38	5,035	5,962
Cambridge, Mass...	91,886	6.00	96,216,875	1.75	1,682,931	18.32	1,047	1.75	30,000	0.33	6.00	40	5,000	5,625
Camden, N. J.....	75,935	9.25	28,654,210	2.65	760,414	10.01	572	1.75	25,000	0.33	49.00	25	510	918
Columbus, O.	125,560	16.25	66,847,590	2.47	1,653,928	13.17	1,065	1.24	55,000	0.44	117.41	30	469	704
Dayton, O.	85,333	10.75	45,364,300	2.68	1,215,763	14.25	1,172	1.21	19,683	0.23	31.17	..	631	....
Denver, Colo.	133,859	54.00	134,364,115	0.91	1,314,237	9.82	1,004	1.86	40,000	0.29	26.00	..	1,538	....
Des Moines, Ia....	62,139	56.00	13,871,430	4.92	683,711	11.00	893	1.23	14,549	0.24	61.00	..	238	....
Detroit, Mich.	285,704	29.00	247,248,500	1.57	3,777,425	13.23	1,082	1.48	128,760	0.45	298.00	28	432	694
Fall River, Mass...	104,863	41.00	74,554,380	1.89	1,412,588	13.47	711	1.89	30,000	0.29	76.00	35	857	1,102
Grand Rapids, Mich.	87,565	17.00	61,000,000	1.65	1,004,954	11.48	1,161	0.99	42,000	0.48	144.00	45	292	292
Hartford, Conn. ...	79,850	17.00	69,760,630	2.21	1,543,087	19.32	875	2.21	62,823	0.78	85.13	..	710	....
Indianapolis, Ind. ..	169,164	28.14	129,184,950	1.95	2,519,106	14.89	1,145	1.30	47,000	0.28	86.00	50	547	492
Jersey City, N. J...	206,433	16.29	95,602,562	2.80	2,676,872	12.48	662	1.96	71,000	0.34	130.00	35	546	702
Kansas City, Mo...	163,752	26.30	80,000,000	2.45	1,960,000	11.97	1,221	0.98	82,000	0.50	180.00	32	455	640
Lawrence, Mass. ..	62,559	7.25	39,841,697	1.59	634,214	10.14	849	1.19	.....	...	2.25	65	....	....
Los Angeles, Cal...	102,479	43.20	67,599,920	1.47	993,719	9.69	661	1.47	88,223	0.86	24.30	..	....	....
Louisville, Ky.	204,731	20.50	127,000,000	2.03	2,580,612	12.60	1,034	1.22	100,000	0.53	167.00	36	653	816
Lowell, Mass.	94,969	12.40	71,674,588	1.93	1,383,265	14.57	755	1.93	28,000	0.29	18.25	35	1,534	1,972
Lynn, Mass.	68,513	11.33	52,168,015	1.90	992,534	14.49	896	1.61	5,000	0.07	4.00	34	1,250	1,654
Memphis, Tenn. ...	102,320	16.00	43,000,000	2.17	934,655	9.13	700	1.30	20,000	0.20	85.00	65	235	163
Milwaukee, Wis. ..	285,315	23.00	158,174,873	2.22	3,506,172	12.29	924	1.33	106,580	0.37	110.80	..	962	....
Minneapolis, Minn..	202,718	53.50	102,212,506	2.37	2,419,806	11.44	840	1.42	41,513	0.20	103.11	27	403	672
Nashville, Tenn. ...	80,865	9.50	38,485,840	1.95	750,239	9.28	634	1.46	32,700	0.40	5.98	32	5,485	7,713
Newark, N. J.....	246,070	18.50	157,320,684	2.11	3,426,465	13.92	909	1.52	85,000	0.35	119.00	36	714	892
New Bedford, Mass.	62,442	19.75	62,896,040	1.74	1,094,391	17.53	1,007	1.74	14,927	0.24	20.00	27	746	1,243
New Haven, Conn..	108,027	22.00	99,000,000	1.64	1,623,394	15.03	916	1.64	43,250	0.40	46.97	..	921	....
New Orleans, La...	287,104	196.25	139,230,286	2.20	3,063,066	10.67	606	1.76	120,303	0.42	205.76	40	584	657
Oakland, Cal.	66,960	18.80	44,720,766	2.16	966,105	14.44	1,002	1.44	18,250	0.27	115.00	40	159	179
Omaha, Neb.	102,555	24.50	36,374,186	3.40	1,236,722	12.06	887	1.36	22,000	0.21	85.21	45	258	258
Paterson, N. J.....	105,171	8.36	50,000,000	2.50	1,233,319	11.73	713	1.67	30,000	0.29	60.00	36	500	625
Portland, Ore.	90,426	30.50	29,554,209	3.37	995,977	11.01	980	1.12	38,595	0.43	234.30	36	165	206
Providence, R. I...	175,595	18.29	192,801,860	1.60	3,084,830	17.57	1,098	1.60	60,310	0.34	31.89	30	1,891	2,836
Reading, Pa.	78,061	6.25	43,942,665	1.62	714,658	9.15	1,070	0.86	15,000	0.19	12.00	42	1,250	1,339
Richmond, Va.	85,050	5.00	69,552,821	1.40	973,939	11.45	988	1.16	60,004	0.71	28.00	42	2,143	2,296
Rochester, N. Y....	162,608	18.18	115,569,790	1.55	1,793,000	11.03	888	1.24	58,365	0.36	125.00	27	467	778
Scranton, Pa.	102,026	21.00	23,354,046	3.12	728,646	7.14	654	1.09	12,629	0.12	20.25	..	623	....
Somerville, Mass...	61,643	4.22	53,790,200	1.69	907,440	14.72	873	1.69	0,300	0.15	3.50	40	2,657	2,989
Springfield, Mass...	62,059	38.53	72,358,481	1.49	1,077,375	17.36	1,166	1.49	24,912	0.40	45.90	36	543	679
St. Joseph, Mo.....	102,979	35.00	24,000,000	2.87	689,992	6.70	466	1.44	12,000	0.12	25.00	40	480	540
Seattle, Wash.	80,671	30.00	40,148,265	1.35	542,001	6.72	822	0.81	10,074	0.12	14.14	..	712	....
St. Paul, Minn....	163,065	55.00	90,000,000	2.65	2,385,000	14.63	849	1.72	70,000	0.43	46.00	36	1,522	1,902
Syracuse, N. Y.....	108,374	16.00	87,103,153	2.13	1,855,245	17.12	804	2.13	79,383	0.73	37.24	..	2,132	....
Toledo, O.	131,822	28.57	64,051,410	2.47	1,582,070	12.00	810	1.48	45,405	0.34	139.70	26	325	562
Troy, N. Y.....	60,651	9.10	53,913,814	1.40	754,262	12.44	889	1.40	105,000	1.73	37.26	25	282	508
Trenton, N. J.....	73,307	7.26	33,448,521	2.22	741,255	10.11	741	1.36	12,000	0.16	20.00	36	600	750
* Washington, D. C.	278,718	69.25	198,488,413	1.52	3,014,360	10.82	1,070	1.00	161,000	0.58	266.00	35	605	778
Wilmington, Del....	76,508	10.18	40,000,000	2.10	840,000	10.98	784	1.40	15,000	0.20	54.00	25	278	500
Worcester, Mass. ..	118,421	36.00	114,278,135	1.52	1,741,602	14.71	965	1.52	32,000	0.27	12.00	40	2,667	3,000
Total 6,251,740	....	.....	...	$77,741,779	$632.49	$44,971	$74.25	$2,344,857	$18.60	....	..	....	....
Average 122,583	....	.....	...	$2,524,348	$12.44	$892	$1.30	$45,977	$0.37	....	..	....	....

* Washington, D. C., is taxed for one-half of expenses, minus receipts from liquor licenses and from corporation anuuities, the United Statees government paying one-half of all expenses, the appropriation being $4,184,542.

NOTE.—Where the per capita valuation of cities varies $150, either above or below the average of $892, there is clearly some discrepancy in the enumerated population or in the reported ratio of real to assessed value.

STATISTICS OF GEORGIA MUNICIPALITIES

Compiled By Hon. Bridges Smith, Mayor of Macon, Ga., and Published With His Permission

Table No, 1

City.	Population.	Rate taxation per 1,000.	Water works owned by:	Price per 1,000 gallons.	Price per single opening.	Electric lights owned by.	No. arc lamps.	Price per arc per annum.	Police. No.	Police. Salary.	Police. Chief.	Firemen. No.	Firemen. Salary.	Firemen. Chief.	Kind of Dept.
1. Atlanta	89,872	$1.52	C	7½c	....	P	1,185	$82.50	325	$730	$2,200	118	$660	$4,000	R
2. Savannah	54,244	1.45	C	12½c	....	P	512	72.00	80	664	1,800	82	600	2,000	R
3. Augusta	39,441	1.25	C	10c	$5.00	P	349	68.00	52	720	1,500	62	660	1,500	R
4. Macon	23,272	1.25	P	30c	6.00	P	153	100.00	48	660	1,200	54	600	1,200	R
5. Columbus	17,614	1.20	P	20c	12.00	P	157	50.00	36	720	1,350	27	600	1,000	R
6. Athens	10,245	1.00	C	10c	....	C	117	48.00	16	600	1,000	15	480	900	R
7. Brunswick	9,081	1.40	P	Ct.	....	P	52	80.00	10	720	1,000	7	480	900	R
8. Americus	7,674	1.25	C	20c	10.00	P	55	72.00	4	600	720	6	500	800	R
9. Rome	7,291	1.10	C	20c	3.00	P	80	96.00	12	600	900	8	600	100	T
10. Griffin	6,857	1.00	C	15c	0.75	C	59	50.00	9	600	720	...	...	....	V
11. Waycross	5,919	1.00	C	6c	6.00	P	44	75.00	5	540	660	4	360	480	T
12. Thomasville	5,800	.95	C	15c	....	P	84	89.25	5	600	800	5	400	600	R
13. Valdosta	5,613	.70	C	20c	8.00	P	50	60.00	5	600	900	1	300	....	T
14. Milledgeville	5,000	1.15	P	15c	....	P	46	60.00	4	600	600	6	360	n	T
15. Gainesville	5,000	1.00	C	15c	....	C	55	60.00	4	400	4,00	3	420	n	T
16. Albany	4,606	.75	C	....	9.00	C	60	30.00	5	720	1,200	5	600	900	R
17. Marietta	4,444	.68	P	12½c	10.00	P	40	67.20	3	600	600	75	...	....	V
18. Dalton	4,316	1.00	C	....	2.00	P	...	....	3	300	400	25	300	n	T
19. La Grange	4,274	6½m	P	30c	....	P	39	82.50	5	480	720	15	300	300	T
20. Cordele	4,000	1.00	C	....	12.50	P	30	100.00	4	480	600	4	pf	pf	V
21. Elberton	3,834	.75	N	....	....	C	50	30.60	3	550	600	...	...	....	V
22. Newnan	3,654	1.00	C	....	0.50	P	29	....	3	510	540	30	...	450	V
23. Washington	3,300	.85	C	....	....	C	20	....	1	900	....	...	...	....	V
24. Cartersville	3,300	.60	C	10c	6.00	..	...	....	2	480	480	60	...	n	V
25. Barnesville	3,036	1.00	C	12c	....	C	45	....	4	600	720	12	pf	25	V
26. Dawson	3,000	....	P	10c	12.00	C	56	39.94	3	540	720	3	360	900	R
27. Dublin	2,087	1.00	C	15c	....	C	39	60.00	3	550	720	20	300	300	T
28. Cedartown	2,838	1.25	C	17c	6.00	C	30	....	2	480	540	40	...	....	V
29. Bainbridge	2,700	8m	C	f	f	P	30	75.00	2	480	900	...	...	60	V
30. Tallapoosa	2,700	9m	P	....	....	P	50	75.00	2	420	480	25	...	....	V
31. Cuthbert	2,641	1.20	C	10c	....	C	53	....	2	480	600	50	n	250	V

Table No. 2

City.	Salaries. Mayor.	Salaries. Clerk.	Salaries. Treasurer.	Pay of labor per day.	Saloons.	License on Delivery Wagons. 1 horse.	License on Delivery Wagons. 2 horses.	License on Drays. 1 horse.	License on Drays. 2 horses.	License on Hacks. 1 horse.	License on Hacks. 2 horses.	License on Insurance Companies.	License on Book Agents.
1. Atlanta	$2,500	$2,400	$1,000	$1.00	426	$15	$25	$15.00	$25.00	$15.00	$25.00	$50	$25
2. Savannah	2,500	2,000	2,500	1.00	225	6	12	8.00	12.00	6.00	12.00	50	n
3. Augusta	3,000	1,650	2,200	1.40	85	5	10	5.00	10.00	5.00	10.00	100	..
4. Macon	3,000	1,500	2,000	.80	69	10	20	15.00	25.00	15.00	25.00	50	60
5. Columbus	1,500	1,500	1,500	1.00	29	10	20	10.00	20.00	10.00	15.00	50	..
6. Athens	1,000	1,450	....	.85	d	n	n	5.00	10.00	5.00	10.00	50	..
7. Brunswick	780	1,200	600	1.00	26	n	n	5.00	10.00	10.00	15.00	..	n
8. Americus	900	1,000	....	.80	n	n	n	10.00	20.00	10.00	15.00	15	†
9. Rome	500	1,500	300	.90	d	n	n	10.00	20.00	10.00	20.00	25	n
10. Griffin	400	300	....	.75	10	n	n	15.00	30.00	10.00	20.00	10	†
11. Waycross	400	800	200	Convicts	n	n	n	6.00	8.00	6.00	8.00	15	..
12. Thomasville	600	300	600	.75	n	20	30	20.00	30.00	20.00	30.00	25	$2.00 per day
13. Valdosta	400	800	200	.75	8	n	n	5.00	10.00	5.00	10.00	15	n
14. Milledgeville	300	720	....	.75	7	n	n	10.00	15.00	10.00	15.00	..	..
15. Gainesville	400	480	50	.75	n	n	n	5.00	10.00	5.00	10.00	25	n
16. Albany	500	650	300	.75	30	5	n	10.00	20.00	10.00	....	20	60
17. Marietta	500	1,000	50	.75	n	n	n	7.50	15.00	7.50	15.00	10	..
18. Dalton	250	500	75	.75	n	n	n	8.00	12.00	5.00	5.00	10	$1.00 per day
19. La Grange	350	360	360	.75	d	n	n	7.00	12.00	7.00	12.00	10	n
20. Cordele	300	600	....	.75	n	n	n	6.00	11.00	6.00	11.00	26	$1.00 per day
21. Elberton	300	720	....	.75	n	n	n	7.50	10.00	5.00	10.00	10	60
22. Newnan	300	500	125	.75	n	n	n	8.00	15.00	10.00	15.00	10	..
23. Washington	200	120	120	...	n	n	n	n	n	n	n	n	n
24. Cartersville	200	75	50	1.00	n	n	n	3.00	5.00	....	....	25	..
25. Barnesville	200	300	....	.75	d	10	20	10.00	20.00	10.00	20.00	10	n
26. Dawson	500	250	150	...	n	n	n	5.00	10.00	5.00	10.00	10	$1.50 per day
27. Dublin	300	720	100	.75	n	6	10	6.00	10.00	....	....	10	..
28. Cedartown	150	200	100	.85	n	5	10	10.00	15.00	....	....	..	n
29. Bainbridge	150	150	200	.75	8	5	10	5.00	10.00	10.00	10.00	25	10
30. Tallapoosa	100	200	100	...	n	n	n	15.00	25.00	n	n	n	n
31. Cuthbert	450	150	Fees	.50	n	n	n	10.00	15.00	10.00	10.00	15	$1.00 per day

P Private corporation. C City. f Free. pf Per fire. m Mills. Ct Contract. n None. R Paid. V Volunteer. T Paid and Volunteer † By mayor. d Dispensary. All cities are lighted by electricity except Dalton uses gas and Cartersville gasoline.

FIREMEN GIVE FIRST AID TO THE INJURED

A Course of Instruction Much Needed—Boston, Chicago, St. Paul and Jersey City Will Instruct Their Firemen This Winter—Long Been in Vogue in Many European Cities

To many of the fire departments in Europe there has been added a valuable addition to the regular instruction in fire fighting. This is found in the "first aid to the injured" that all the firemen over there study. In the United States some of the fire departments are copying this system of the old world and none have made greater progress in this respect than the firemen of Boston. Dr. H. H. Hartung told how the men are instructed in an address at the recent convention of the Massachusetts State Association held in Boston. He said:

"Emergency lectures are given under the auspices of the Massachusetts Hygiene and Emergency Association to the police and fire departments of Boston once a season. The object of these lectures is to instruct the men to aid themselves and others, who have sustained bodily injuries, so that they can, in an emergency, save life and limb, if possible, of those awaiting the arrival of a physician or surgeon, who might otherwise be doomed to unnecessary suffering and death. Of the value of these lectures I can speak from personal experience, for I know of a number of instances where men who have taken these lectures have been able to render valuable assistance to the injured and to the physician who has been called to attend the case, and have afterwards been commended by the physician for their skill. The lectures are given in some convenient room in one of the houses selected by the fire commissioners, and the men are detailed in squads of twenty-five to thirty, and must attend the lectures. Lectures are given once a week for four weeks until the various subjects have been gone over, and at the conclusion an oral or written examination is given to test the men. Those who qualify are given a certificate, and to make this certificate more official and valuable, it is approved and signed by the fire commissioners. The outfit furnished by the Association to aid in demonstrating the lectures consists of a skeleton, several wall charts, showing skeletons, muscles, nerves, blood vessels, the various organs of the body, bandages and splints. Each lecture lasts about one hour, and conforms to the text outlines in the little book called "Handbook of First Aid to the Injured." The men are advised to buy these books and study them between the lectures; they are furnished by the Association and are sold to the men at cost—25c each. These lectures are made as simple and plain as possible; scientific and technical terms are avoided, as they would otherwise confuse the men.

BOSTON RED CROSS FIREMEN

"The first lecture is devoted to familiarizing the men with the different bones, blood vessels, organs, etc., of the body, together with their location and functions for it is important and clear that, before they can understand and render aid to the injured, they must have some idea of the anatomy of the human body. The number, kind, and location of the bones are demonstrated, also the particular bones and locations where they are liable to be broken, the joints of the body most liable to injury and dislocation, also location and course of the most important veins and arteries, and where pressure should be applied to stop bleeding. At the conclusion of each lecture proper about fifteen minutes is devoted to teaching and demonstrating the application of splints and bandages, with particular reference to the Esmarch's triangular bandage, which is adopted on account of its especial fitness for use in accident cases; these bandages are illustrated, showing how they may be applied. The men are shown how to apply these bandages, and are then expected to practice applying them on one another. After a little practice they become quite proficient in applying bandages and splints. At the conclusion of each lecture the men are given an opportunity to ask any questions they may wish in regard to the lectures.

"The demonstrations consist of:

"1. Bandaging the head in case of injuries to the head by the use of Esmarch's triangular bandage.

"2. Application of bandage to an injured eye.

"3. Application of bandage to an injured ear.

"4. Application of bandage to an injured forehead.

"5. Application of bandage to broken jawbone.

"6. Application of bandage to a dislocated, sprained or injured shoulder joint.

"7. Application of bandage as a tourniquet to stop severe bleeding in the arm. Various articles used.

"8. Application of splints and bandages to a broken forearm.

"9. Demonstration of the use of the triangular bandage as a broad sling, as a narrow sling.

"10. Application of bandage to an injured hand.

"11. Application of an Esmarch bandage as a tourniquet for stopping bleeding from the leg.

"12. Application of bandage to an injured knee.

"13. Application of bandage to injured foot.

"14. Demonstration of the application of splints and bandages to a broken leg. Using anything convenient for splints.

"15. Demonstration of the placing and transportation of an injured person in an improvised litter. Three different ways.

"16. Demonstration of artificial respiration as applied to persons suffocated by smoke, gas, etc."

During the winter months the firemen of Chicago are to be given a course of training for emergency cases. At the Harvey Medical Institute the men will take lessons such as are taught the Boston men. The men are to attend the lessons in squads and, not only will the

faculty of the Institute take part in giving instruction, but members of other medical schools will make addresses and give lectures to the classes.

The members of the fire department of St. Paul, Minn., are also to be instructed in this work. The apparatus is to be equipped with "first-aid" outfits. Physicians from the city, or lecturers from the State University, or other medical colleges, will instruct the men in the temporary dressing of wounds and the resuscitation of persons overcome by smoke. Plans for this work have not been completed, but it is hoped to get them in working order in a few months.

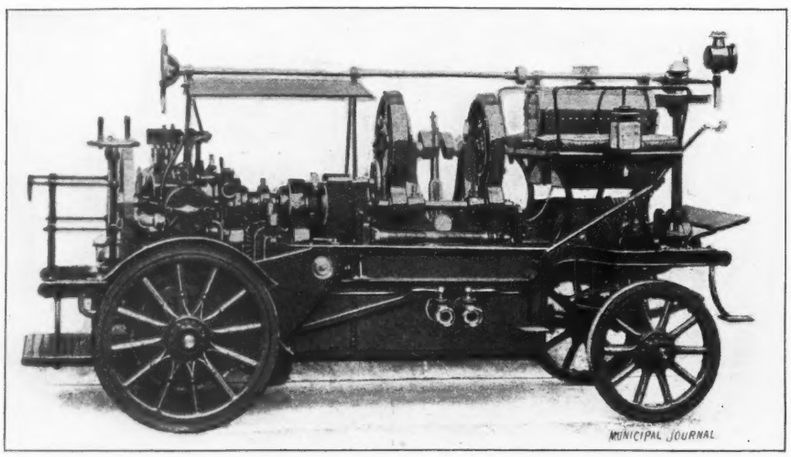
Still another city will soon have firemen that are trained nurses. The Hudson City Branch of the Young Men's Christian Association has organized a "First Aid to the Injured Class." An invitation has been extended to all the firemen of Jersey City, N. J., who may wish to avail themselves of the privilege, to attend the course of instruction that is to be given.

SOME FOREIGN MOTOR FIRE ENGINES

Improvements Made by Other Countries—Fire Apparatus Run by Alcohol, Steam and Electricity

A German Motor Fire Engine

THE illustration which we reproduce represents the automobile fire-engine of the Deutz Gasmotorenfabrik, on show at the recent Dusseldorf Exhibition, and which was built in Breisgau. It is a horizontal motor adapted for the use of alcohol and mounted above the rear axle,



GERMAN MOTOR FIRE ENGINE RUN BY ALCOHOL

where it can be controlled by the machinist who stands on the platform at the rear. The projecting shaft of the engine is provided with two clutches which engage either with the mechanism driving the vehicle or with the pump. The operation is alternative, so that when the engine is propelling the vehicle the pump apparatus is out of action, and on the other hand the driving mechanism is completely out of gear while the pump is being operated at the scene of the fire. The pump mechanism itself is situated between the front and rear wheels, and is mounted in the middle of the frame, being so arranged as to be easily accessible from either side. Seats for four are provided in front, these being on either side of the petrol or alcohol reservoir. The necessary accessories and hose are also carried in front. The framework is of wrought iron, and is carried by strong springs on the bearings of the axles. The motor is of the two-cylinder Deutz type, and it normally develops 15-h. p. It is provided with magneto ignition, enabling the engine to be instantly started. It is claimed that the rapidity of getting under way is the chief advantage of this petrol motor fire-engine over steam fire-engines, the latter requiring a sensibly longer time to get on the road. The petrol reservoir carries sufficient petrol or alcohol for continuous working for a period of ten or twelve hours, at an hourly consumption of five litres.—[*The Automotor Journal*, London.

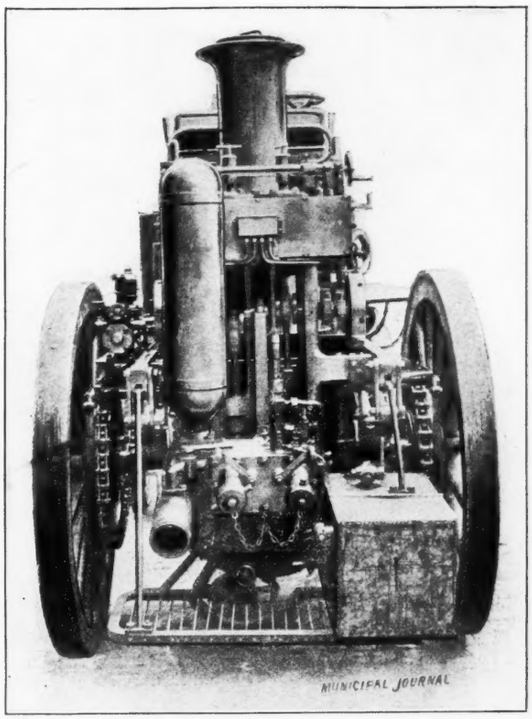
A London Motor Fire Engine

IT is with special satisfaction that we record the fact that the London County Council Fire Brigade now possesses a self-propelled fire engine, and that we are able to give a description of the machine itself, after having so often pointed out the advantages and urged the employment of such engines. This fire engine is largely of an experimental nature, and only differs from the ordinary horse-drawn model in that the front axle and wheels are redesigned to suit the steering requirements, and that the propelling engine, with its transmission gearing to the rear wheels, has been added. Thus we find that the boiler is placed towards the rear, and that the pumping engine with its pumps is fixed immediately behind it. The boiler is of that type in which horizontal tubes pass across and connect the narrow annular water space formed between an inner and an outer vertical shell. The tubes in each layer are parallel with one another, and those forming each alternate layer cross the others at right angles. It is fired with oil fuel by means of a Clarkson burner, as in some of the horse-drawn machines. The normal working pressure is 110 lbs. per square inch. This pressure of steam can be obtained from cold water in from five to six minutes, if necessary, although, as a rule, the boiler is kept hot by a gas flame when the engine is in the fire station, and an immediate start can be made at any time. The pump engine runs at a normal speed of 250 revolutions per minute, and the pumps deliver

MOTOR FIRE ENGINE OF LONDON COUNTY COUNCIL—SIDE VIEW

about 350 gallons of water per minute, at a pressure of 140 lbs. per square inch.

An entirely separate engine of the horizontal, high-pressure, double-acting type is fixed to the main frame beneath the driver's seat. The crank shaft of the engine is connected with a differential countershaft, by means of a chain, the chain passing over a sprocket fixed to the shell of the differential gear. The counter-shaft lies



MOTOR FIRE ENGINE OF LONDON COUNTY COUNCIL—REAR

behind the crank-shaft, and its ends carry sprockets, from which outside chains transmit the power to the rear wheels.

The fuel tank is placed beneath the driver's seat, and the oil is drawn from it to a separate tank which supplies the burner. The fuel in this latter tank is kept under pressure by a steam pump of the reciprocating pattern, and a relief valve passes back any surplus oil to the main tank if the pressure rises above a certain point.

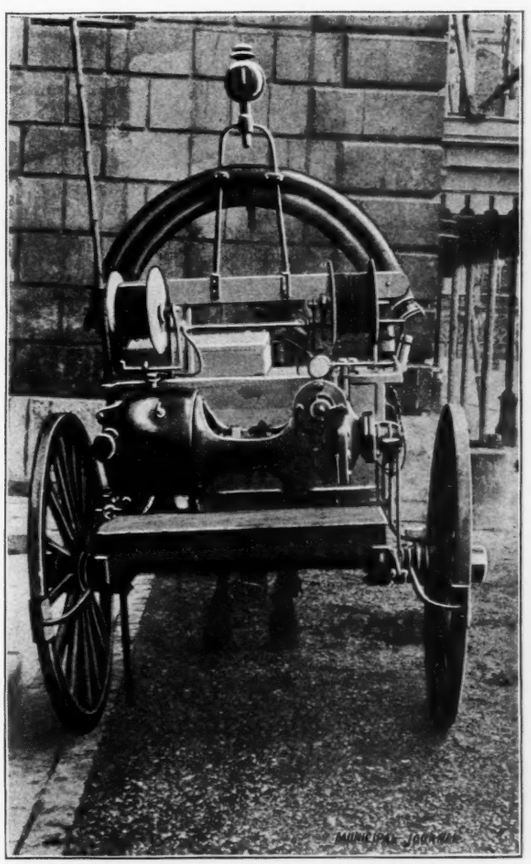
Sufficient water is carried for running about twenty miles, and the fuel supply is expected to enable the engine to run this distance and then operate its fire pumps for three hours.

Five brakes in all are fitted, one on each road wheel and one on the counter-shaft. A foot pedal applies the last mentioned, and if depressed still further it brings the rear wheel brakes into operation. A hand lever is used for the front wheel brakes; they are ingeniously arranged so that they can come into use at any time without affecting the steering. Steering is effected from a hand wheel, and the steering pivots of the front wheels are arranged inside their hubs; the wheels thus turn about their point of contact with the road, and are less easily deflected from a straight course by any obstacles in the road.

As we have already stated, this interesting machine is an experimental one. It is fitted with iron tires, although solid rubber tires will probably be used instead ultimately. The engine which propels it is always in gear with the driving wheels, although a change-gear, giving two or more different speeds, may be found necessary in hilly localities. Two different sized sprocket wheels have been provided for trial on the countershaft ends. The wheel base is 6 ft. 6 in., the tread is 4 ft. 6 in., the front wheels are 3 ft. in diameter, and the rear wheels are 4 ft. in diameter. No road trials have as yet been made with this latest acquisition of the fire brigade, but these will probably be commenced very shortly. We have no hesitation in saying that we anticipate a very general substitution of these self-propelled machines for the horse-drawn engines in the near future, and we are indeed pleased to see that Commander Wells has taken up the question in such a public-spirited manner.—[*The Automobile Journal*, London.

Electric Fire Pump

THE fire department of Rouen, France, has been experimenting with a new fire pump, invented by a captain of a fire company. It is run by an eight horse-power motor of 2,000 revolutions a minute, and is of the centrifugal pattern. A current of 525 volts can be utilized. The motor is well covered so that all water is excluded. When the engine reaches the scene of a fire, one end of a wire is attached to the nearest electric railway or electric light wire, while another wire is coupled to the railway track, forming the complete circuit. It takes about one minute to get the pump in working order. The wire which is attached to the railway or electric light wire is about 656 feet long, and if to this is added about 600 feet of hose and



ELECTRIC FIRE PUMP OF ROUEN, FRANCE

the 114 feet to which the water can be thrown, a distance of some 1,427 feet can be covered from the source of the electric current. A seven-tenths-inch nozzle is used, and this will supply a volume of 92½ gallons a minute. The whole machine is so light that it can be drawn by one horse in a two wheel wagon. Including two men on the seat, it weighs about 2,300 pounds. The motor and pump are about forty inches long and twenty inches wide. On the back of the machine is carried the hose, hooks, axes, etc.

Views of an English Fire Chief

SUPERINTENDENT ELY, the Chief of the Leicester, England, Fire Brigade, who recently attended the convention of the International Association of Fire Engineers, held at New York, has just submitted his report to the Fire Brigade Sub-Committee of the Leicester Corporation. The Superintendent says that in drawing a comparison with the American and English systems, it is not surprising to find the expenditure in the American service is enormously in excess of that of England. This is accounted for by the very great risks to be provided for, owing to defective building construction, to the abnormally high salaries paid to the members, to the extensive apparatus, for which high prices are paid, and also for the magnitude of the fire alarm systems, which necessitates a large staff of skilled workmen to maintain them. Speaking to the chief of one of the largest cities in the States, who had paid a visit to England, he stated that we did not dread fire as they do in the States. This is due to the construction of our buildings, the floors of English buildings of any importance being made of concrete and iron, a plan which the Americans are now adopting. He also believed that America could better profit by imitating our buildings than we can in imitating their fire appliances.

CHIEF WILLIAM ELY

In order to compare the cost of American brigades with that of Leicester, Superintendent Ely has tabulated statistics relative to the cost of seventeen American brigades in towns and cities up to 250,000 inhabitants. The table is as follows:

Town or City.	Population.	Acreage	Paid Firemen.	Steamers.	Fires.	Cost of Maintenance. £	Cost per head of Population. s.	d.
Newark, N. J.	246,070	11,840	206	17	657	57,327	4	7¾
Jersey City	206,433	7,731	188	14	550	45,141	4	4¼
Louisville, Ky.	204,731	12,800	207	17	751	51,258	5	0
Minneapolis	202,718	11,705	291	22	979	64,663	6	4½
Providence	175,597	11,357	248	9	621	63,999	7	3¼
Indianapolis	169,164	17,792	170	9	927	33,731	3	11¾
Kansas City	163,572	16,640	194	8	1074	45,277	5	6¼
St. Paul	163,065	35,483	101	15	805	38,447	4	8½
Rochester	161,660	11,303	200	8	396	48,740	5	11½
Denver	133,859	30,208	122	8	518	28,135	4	2¼
Toledo	131,822	18,284	131	8	459	22,577	3	5
Allegheny	129,896	4,800	113	11	300	26,546	4	1
Columbus	125,560	10,400	188	14	533	34,046	5	5
Worcester	118,421	21,772	120	7	582	32,040	5	4¾
Syracuse	108,374	10,498	129	9	319	34,286	6	3¾
Albany	94,151	6,913	124	11	629	27,214	5	9¾
Troy	60,651	3,368	49	8	202	10,329	3	4¾
Average	152,746	14,287	168	11	610	30,045	5	0
Leicester, 1901-2	211,581	8,586	8	2	173	2,216	0	2½

There are 16 auxiliary firemen in Leicester.

The following points are those which Superintendent Ely particularly emphasizes and recommends for adoption:

"First, and most important, is that relating to the steam and oil-propelled motor engines, and especially the chemical fire engines. As I have already mentioned, the main object is to get to fires even quicker than horses can take the engines, and also to save the enormous cost of horseflesh and the incidentals attached thereto, together with the advantage gained by the large percentage of fires which are extinguished by the chemical engines, and I have no hesitation in saying that at least 80 per cent. of our fires in Leicester could be extinguished by the use of one of these chemical engines; and I therefore strongly and confidently recommend that a motor wagon be purchased, to be fitted with a chemical cylinder, to hold fifty gallons, with seats for four men and driver, the seats to be made into pockets to hold a few lengths of hose, stand pipes, etc., and one scaling ladder. This would be a very useful combination, and by the adoption of it I should be able to dispense with one or two horses, which would soon save the cost of the purchase. I estimate that the cost of one of these machines would be about £650 complete.

"Secondly, I would also recommend that the 'quick-hitching' or 'swing-harness' be adopted. These are in general use in every brigade in the States, and also in use in most of the English up-to-date brigades, and are the means of saving a few seconds in turning out to the fire. The cost of this would be about £50.

"Thirdly, I would also suggest that attachments be made to the suction inlets of our steamers, so that the water may be taken direct from the main, instead of running it into a cistern as at present. This arrangement would save a considerable amount of time in getting our engines to work and prevent a very large quantity of water running to waste, which is now the case, owing to an overflow of the cisterns. The cost of these arrangements I estimate would be about £40.

"Fourthly, I would further like to adopt a few lengths of rubber-lined hose, to be used in entering and passing through private premises, as well as factories and warehouses, as it is entirely water-tight up to a pressure of 200 pounds per square inch. The use of this would prevent a serious loss by water damage, and I would mention that nothing but rubber or rubber-lined hose is used in the States, but it is both too bulky and expensive for general use in our department. There are several other small improvements which I need not detail here, but of which I feel sure you will sanction, and which I shall be able to make on the premises with the aid of the staff, without entailing any further cost than the purchase of the material. —[*The Municipal Journal*, London.

Pasteurized Milk Lowers Death Rate

THROUGHOUT the past summer in New York city the sterilized milk depots established through the charity of Mr. Nathan Straus, have had more than they could do to supply the demand. During the warm season 976,040 bottles of Pasteurized milk and milk foods were given away, and more than 1,000,000 glasses of raw and pasteurized milk were drunk on the premises. In order to remove the stigma of pauperism that might attach to this charity, Mr. Straus has allowed people to pay one cent a bottle for the milk, but in a great many instances, especially in the tenement districts, the milk was given free.

All physicians who work among the poor are given tickets which they may distribute as they see fit. These tickets will secure the Pasteurized milk at any of the stations. Twenty charitable societies are also used by Mr. Straus for distributing the milk. The Health Department is co-operating with this work and has issued a card of instructions relative to the proper care of infants and their nourishment, and these, with the milk, are given to the tenement dwellers.

One of the associate physicians in the Health Department has stated that the low death rate among children under five years of age in New York City is almost directly attributed to the wide distribution of this milk and, to prove the assertion, he quotes the death rate for the last ten years, showing that in 1892 the rate was 136.1, while in 1902 it was 63.6.

Fourteen depots were in operation throughout the summer, but four of these will be maintained the year around. Mr. Straus has been considering the erection of a new laboratory to meet the great demands that have come for the milk.

Work of a similar kind has been going on on the other side of the Atlantic in the borough of Battersea, London. Battersea is known as the "Municipal Mecca" because of the wide spread of municipal ownership. The sale of municipal milk for children was begun as an experiment, but has proved a decided success and the laboratories and distributing stations will be greatly increased. Without any attempt to advertise its advantages, during the past three months it has secured about one hundred and sixty regular customers, and the number has been increasing every day. People from all parts of the borough come to the milk stations, and this means that some have to come a distance of two or three miles every day. The effect of this pure milk has already been noted in the health of the children of the Borough, and the number of deaths from diseases due to impure milk was reduced from one hundred and fifty last year to twenty-four during the past summer.

WHAT POLICE AND FIREMEN ARE DOING

Rochester Buys a Water Tower—Wireless Fire Alarm Telegraph—Meeting of Police Associations—Parlor Matches Barred Out

First Water Tower for Rochester

THE fire department of Rochester, N. Y., has been lately equipped with a "Champion" water tower, supplied by the Fire Extinguisher Manufacturing Company of Chicago. As yet no regular company has been organized for service with the tower, but details will be made up from the other companies to man the tower when necessary. Tests of the tower proved all that the builders claim for it, and it will prove a valuable addition to the fire fighting forces of the city.

London to Have Better Fire Ladders

THE short fire escapes of London are disappearing. The 95 machines of the Metropolitan Fire Brigade which have hitherto been capable of reaching to a height of 40 feet only are now being fitted with what are technically known as "extension ladders," enabling the appliances to be used for life-saving purposes to a height of over fifty feet. Officers and men of the brigade are being successfully instructed daily at the headquarters in Southwark Bridge Road in the manipulation and adaptation of the improved machine.—*The Municipal Journal,* London.

Bakers Must Keep Out Flies

THE Health Department of Buffalo has found that many bakeries are operated in such an uncleanly manner as to endanger public health. The rooms in which the baking is done are filthy. Windows are left open so that germs can blow in from the streets. Flies are allowed to contaminate cake and bread and the rules of health that should be obeyed in every shop of this character are ignored. Inspection showed that, while most of the bakers were particular about the cleanliness of utensils, no attention was paid to the flies. The bakers will be ordered to put in screens or else be arrested.

School Books Carriers of Disease

MUCH has been claimed regarding the way in which disease is spread among school children because of the interchange of books and utensils. Not long since in Albany, N. Y., an agitation was started for the purpose of having all school books disinfected at the end of each day's session. Many doctors backed the idea, but the Superintendent of Public Instruction considered it nonsense and a hobby of the doctors. There is no doubt, however, that many cases of disease have been caused by means of these and library books and in the most progressive libraries, books are frequently disinfected, and especially when it is known that they were exposed in houses in which there were cases of disease.

War on Unclean Restaurants

THE Health Board of Indianapolis has started war on the unclean restaurants. Despite the limited means at their disposal, the sanitary officers intend to make a thorough inspection. Two days are given offending proprietors to clean up their kitchens and then, if conditions are not remedied, arrests will follow. The inspector has found many cases where kitchens and ice chests were littered with dirt. In milk cans were found bits of decaying matter due to carelessness on the part of servants. The unsanitary condition of many of the restaurants in London, England, has aroused the press, and as a result it is probable that supervision will be instituted to ensure the proper cooking and preparing of food for the public.

Wireless Fire Alarm Telegraph

THE report of the committee investigating the Queen Victoria street disaster in London, for the Fire Brigade, has been presented to the London County Council, and when the matter is discussed the use of wireless telegraphy as a quick means of alarm, will be also considered. For two years Marconi's Wireless Telegraph and Signal Company has maintained the necessary instruments to enable communication by means of wireless telegraphy, between one of the stations and a temporary sub-station. As this experiment has resulted in a saving of time in turning out appliances at the sub-station, it is the opinion of the Chief that the apparatus should be maintained. The company will ask an increase of $125 over the present annual expense of $250, because of the greater expense involved.

Can Use No More Parlor Matches

AFTER the first of January, 1903, it will be a misdemeanor to sell, store, give away, or have in one's possession in the city of New York, parlor matches. These matches have been classed with dangerous combustibles, the use of which is a violation of the law as set forth in the City charter. During the last year thirteen hundred fires were caused by the use of parlor matches, and Fire Commissioner Sturges will issue no more permits for the sale or manufacture of parlor matches. Hereafter the old fashion sulphur matches or so-called "safety" matches are the only kinds that can be used. A rigid enforcement of the laws regarding the handling of combustibles will prevent the use of almost every kind of combustible material whatsoever. So-called "safety" matches, which are lighted by being struck on the side of the box, are nearly as dangerous as parlor matches, and can be readily lighted if struck on a window pane.

New Regulations at Williamsport

NEW rules have been adopted for the fire department of Williamsport, Pa. It will be a misdemeanor for any person to block the progress of the apparatus through the streets, or to pile goods around, or obstruct the use of a fire hydrant. On "off days" captains shall examine buildings in their districts so that they may be familiar with the interior. No driver shall pass another apparatus unless it is disabled. Horses must not be taken for exercise more than 1,400 feet from the engine house. After eleven o'clock P. M. a tour of the first floor in the station must be made every two hours. On windy nights extra service is to be in force. None but United States mail wagons shall have the privilege of crossing a line of hose when once laid at a fire. Officers must wear white shirts with their uniform, while the men will wear blue. All regular work at the houses must be finished by ten o'clock A. M., and uniforms must be worn until 6 o'clock P. M. No member of the department in uniform shall enter any saloon except in discharge of his duty and no man in uniform shall take part in politics or election except to vote.

The New Orleans Fire Force

PRES. MIEESTER, of the Board of Fire Commissioners, New Orleans, rightly states that "A properly organized fire department with a corps of well trained officers and men produces a sense of security to life and property of its inhabitants." The department at New Orleans consists of twenty-seven steam engine companies, eight hook and ladder trucks, thirteen chemical engine companies, one combination hose and chemical wagon and one water tower, and has a working force of 296 officers and men. The above companies have to cover a territory of 196 square miles, but the rapid growth of the city will necessitate considerable additions to the force to afford proper protection. The river front is fifteen miles long, and Commissioner Mieester considers it all important that at least one powerful fire boat should be added to the fire force to properly protect the large amount of commerce. He also suggests that a fire boat could be of great use in protecting the residents of the sections near the river by having a system of pipes to run from the river up into the city to which the fire boat could be attached in time of need.

American Fire Fighters the Best

THE American in Europe observes with much satisfaction, in the more important cities, the adaptation of our ideas for fighting fires. Our steam fire-engines, our brass poles that bring men down from the upper stories of their station-houses, our hinged collars that snap around the horses' necks at a touch, are everywhere. At every important international exhibition of recent years, beginning even with that of Paris in 1867, American fire-engines and ladder-trucks have taken prizes. At the Paris Exposition of two years ago an American fire-team from Kansas City, fourteen men under Chief George C. Hale, carried off all the most important honors at the International Fire Congress, at which were represented America, France, Portugal, Holland, Norway, Belgium, Switzerland, Denmark, Italy, Germany, Turkey, England, Scotland, Wales, Ireland, New Zealand, India, Austria, Mexico, and Peru. Nearly 8,000 firemen took part in the competitions. The first contest was made with steam fire-engines, on the banks of the Seine. About 100 engines competed. Thes test was made from cold water in the boiler. The average time for foreign engines in getting a stream from the hose was from eight to twelve minutes. Their streams reached about half way across the river. In five minutes and thirty seconds the American engine threw a stream that wet people on the opposite bank, a distance of 310 feet. The size of the stream was nearly double that thrown by the other engines.—From "Fire Fighting of To-Day—and To-Morrow," by PHILIP G. HUBERT, JR., in *Scribner's*.

Massachusetts and Jersey Police Meet

THE annual convention of the Massachusetts Association was held recently at Worcester. The purpose of the organization is to better the conditions of the offices of Massachusetts in the way of legislation, and at the last meeting forty-three delegates, representing eighteen cities, were in attendance. After the session, at which matters of interest to the police were discussed, Deputy Chief of Police William M. Batchelder, of Cambridge, was elected president. Other officers elected were Capt. Henry F. Ryan, Haverhill, Vice-president; Capt. James W. Kenny, Cambridge, recording secretary; Capt. John H. Brown, Everett, financial secretary; Melvill C. Parkhurst, Somerville, treasurer.

The Superior Officers Police Protective Association of New Jersey met in West Hoboken about the same time for its annual convention. A report was submitted by a committee which discussed the right of policemen to shoot in case a prisoner attempts to escape. Chief Benjamin Murphy, of Jersey City, was one of the speakers, and his address related to the necessity of special legislation. Chief Murphy holds that at the present time one municipality cannot procure authority to build a school house unless the consent of some back country assemblyman is secured to pass the bill. The officers of the association for the coming year were elected as follows: Capt. John J. Cleary, Trenton, president; Chief George Tenny, Elizabeth, vice-president; Sergeant M. J. Ryan, Newark, recording secretary; Inspector S. A. Archibald, Jersey City, financial secretary; Capt. John D. Long, Elizabeth, treasurer.

New Police Platoon System

THE dissatisfaction of the New York Police with the present system caused Commissioner Partridge to hold a hearing at which any officer was permitted to speak his mind freely on the subject and suggest any remedy that he might have in mind. Captain Stephen O'Brien presented a scheme for an improved two platoon system. There are in reality four platoons or two platoons divided into two sections each. Under the present system the police day lasts from 6 o'clock in the morning till the same hour next morning and that period is divided into five tours of patrol, as follows: 6 to 8 a. m., 8 a. m. to 1 p. m., 1 p. m. to 6 p. m., 6 p. m. to midnight, midnight to 6 a. m. The police day under the O'Brien system is made to last from 7 o'clock one morning to 7 o'clock the next. It is divided into four tours, as follows: 7 a. m. to 1 p. m., 1 p. m. to 6 p. m., 6 p. m. to midnight, midnight to 7 a. m. This does away with the "dog watch," as the early morning tour of only two hours is called. This, Captain O'Brien maintains, is one of the best features of his system. At present the time of the "dog watch" is the favorite working time of burglars and thieves. The average patrol duty performed by patrolmen under the new system will be five and one-half hours on day tours to six and one-half hours on night tours. Their reserve duty, which lasts from eleven to thirteen hours at a time, is so arranged, that they will always be well rested and in good condition when they leave the station for patrol duty. One-half of the force is always on duty between midnight and 7 o'clock in the morning. Once in every eight days each man has a "night off" following or preceding his regular "day off." This means that he will be excused from duty for twenty-nine and one-half hours in succession. The schedule places patrolmen, roundsmen and sergeants practically on the same footing.

ONE OF NEW YORK'S FINE ENGINE HOUSES

SALARIES OF FIREMEN IN AMERICAN CITIES

Including Those Having a Population of Twenty Thousand and Over

(Concluded from November Number.)

City.	Chief.	Asst. Chief.	Dist. Chief.	Captain.	Lieutenant.	Privates. 1st yr.	Privates. 2nd yr.	Privates. 3rd yr.	Probationers.	Supt. Fire Alarm.	No. paid men.	No. call men.	No. volunteers.	Has Firemen's Relief Asso.
New Britain, Conn.	450	350	....	250	225	200	....	....	....	900	7	33	0	Y
Nashville, Tenn.	1,800	1,200	....	900	840	....	....	780	....	1,500	84	0	0	Y
Newburgh, N. Y.	300	....	....	....	....	....	....	....	....	....	0	0	565	Y
Norristown, Pa.	100	....	....	....	....	....	....	....	....	200	10	0	1,200	Y
Nashua, N. H.	1,200	125	....	105	95	90	....	....	....	x	16	90	0	Y
New Bedford, Mass.	1,500	c600	c300	c162	c150	c150	c150	c150	60	1,500	44	176	0	Y
New Albany, Ind.	800	600	....	600	....	600	....	....	....	730	16	0	0	N
Norfolk, Va.	1,650	1,200	....	840	....	600	660	720	....	1,200	52	0	0	Y
Newport, Ky.	1,200	840	....	720	....	....	....	....	....	840	12	0	0	N
New Haven, Conn.	2,500	1,700	....	{1,000 / 1,200	{1,000 / 900	800	800	‖850	800	1,500	120	0	50	Y
Newton, Mass.	1,800	1,200	....	1,095	....	912.50	....	m1,095	821.25	x	32	60	0	Y
North Adams, Mass.	900	c200	c175	c125	c112	c100	§780	....	....	300	7	42	48	Y
Omaha, Neb.	3,000	{1,200 / 1,800	....	960	900	840	800	850	65 mo.	....	119	0	0	N
Paterson, N. J.	1,800	1,300	....	1,200	....	1,100	....	....	....	1,300	102	0	0	Y
Pittsfield, Mass.	1,100	920	....	600	480	480	....	....	....	x	12	63	0	N
Pittsburgh, Pa.	3,000	1,800	....	1,200	1,050	960	900	‖840	720	2,400	416	0	0	Y
Philadelphia, Pa.	3,600	2,500	1,800	*1,250	‡1,095	225	250	275	....	....	844	0	0	Y
Pawtucket, R. I.	1,200	200	....	840	780	624	780	780	....	1,000	36	20	0	Y
Passaic, N. J.					All Volunteers.				....	450	0	0	340	Y
Peoria, Ill.	1,500	1,200	....	840	....	†780	§960	....	....	1,500	66	0	125	Y
Pueblo, Cal.	1,800	1,620	....	1,020	1,160	1,160	....	....	....	1,200	27	0	0	Y
Providence, R. I.	2,000	1,500	1,400	1,277.50	1,149.75	730	850.45	‖974	730	1,800	255	0	0	Y
Portland, Me.	1,200	{c225 / c200	....	900	821.25	§900	cs125	d821	....	e	41	162	0	Y
Portland, Ore.	1,800	1,200	1,200	{840 / 720	....	§1,020	{d840 / d720	....	....	1,200	56	82	0	Y
Quincy, Ill.	1,100	810	....	....	....	660	780	780	....	....	28	14	0	N
Racine, Wis.	1,000	c200	....	780	....	600	720	720	....	780	19	8	0	Y
Rockford, Ill.	1,200	800	....	750	....	690	....	....	....	690	29	0	0	Y
Rochester, N. Y.	2,280	....	w1,500	1,080	960	720	780	900	730	1,500	210	b	0	Y
Richmond, Va.	1,800	1,200	....	900	840	660	840	c240	....	1,800	68	60	0	Y
Salt Lake City Utah	1,800	1,380	....	1,080	1,020	900	960	....	....	1,200	38	0	0	N
Sioux City, Ia.	1,200	900	....	780	....	660	690	720	....	900	33	0	20	N
Syracuse, N. Y.	2,700	1,800	1,140	1,080	960	900	§1,080	t1,080	638.75	1,500	140	0	0	Y
Schenectady, N. Y.	1,250	1,000	....	....	....	50	55	....	....	75	26	0	260	Y
Springfield, Mass.	1,800	1,400	....	c250	....	100	175	175	260	1,150	73	78	z25	Y
Savannah, Ga.	2,000	1,350	....	960	720	600	660	720	600	1,200	83	0	0	Y
So. Omaha, Neb.	1,200	960	....	960	....	840	840	840	....	960	13	22	0	Y
Salem, Mass.	1,000	c175	....	c110	c110	c100	c100	c100	....	1,250	18	85	0	Y
Springfield, Mo.	780	720	....	720	....	720	720	720	....	720	14	0	0	N
Spokane, Wash.	1,500	1,200	....	960	*930	†900	....	....	900	1,080	63	0	0	N
San Francisco, Cal.	4,000	3,000	w2,100	1,440	1,200	960	1,080	1,200	480	2,400	528	0	0	Y
San Jose, Cal.	1,500	600	....	900	*840	c180	§960	d1,200	....	900	20	36	0	Y
St. Joseph, Mo.	1,800	1,200	....	900	....	720	840	....	....	....	63	0	0	Y
Seattle, Wash.	1,800	1,500	1,320	1,140	1,020	840	840	960	780	1,380	89	0	0	Y
Tacoma, Wash.	1,200	1,020	....	900	840	{600 / 780	....	....	....	840	54	0	0	Y
Topeka, Kans.	1,500	900	....	820	720	†600	u720	....	600	780	30	0	0	Y
Trenton, N. J.	1,500	1,200	....	960	§900	720	780	810	600	1,350	72	0	0	Y
Troy, N. Y.	2,000	1,000	1,000	....	....	60	60	60	....	1,500	56	0	920	Y
Taunton, Mass.	1,200	....	c150	c120	c108	780	c100	....	....	600	17	88	48	Y
Utica, N. Y.	1,500	1,000	....	840	780	600	660	720	730	1,100	64	0	0	Y
Wichita, Kans.	1,200	900	....	780	780	540	660	720	....	900	28	0	0	Y
Washington, D. C.	2,000	1,200	....	*1,000	‡840	†840	§1,000	tsd900	....	1,600	285	0	0	Y
Worcester, Mass.	2,000	1,300	1,200	960	900	840	900	....	....	1,500	135	101	0	Y
Wilkes-Barre, Pa.	500	50c. per hr.	....	600	....	600	600	600	....	870	28	105	0	Y
Williamsport, Pa.	900	....	....	50	....	240	....	....	....	....	23	31	0	Y
Watertown, N. Y.	1,200	x900	....	720	....	600	600	600	....	....	18	5	0	N
Waterbury, Conn.	1,500	350	....	900	....	†840	....	....	....	....	26	32	110	N
Wheeling, W. Va.	1,200	780	....	780	....	†780	....	....	....	780	42	0	0	N
West Superior, Wis.	1,500	1,080	....	840	780	§840	s780	d744	....	....	...	...	...	Y
Wilmington, N. C.	1,200	720	....	*1,080	§540	450	....	....	....	180	33	0	0	Y
Yonkers N. Y.	2,000	1,400	....	1,200	1,100	750	850	1,000	750	....	59	0	700	N
York, Pa.	v200	v25	....	....	....	....	....	....	....	v300	0	0	1,100	Y
Youngstown, O.	1,500	c200	....	1,080	972	§1,068	900	660	{600 / †780	....	36	1	0	..

N No. Y Yes. x Serves as superintendent of fire alarm. † Not graded. c Call men. v Volunteers. § Engineer of steamer. * Foremen. ‡ Assistant foremen. z Substitutes. w Battalion chief. s Stokers. b Watchmen. d Drivers. t Tillermen. h Hostlers. r Secretary. k Senior captain. e City electrician. g Alarm kept up by telephone company. a Union. ‖ 4th year, Chicago, $1,134; Brockton, $1,134; Boston, $1,200; Detroit, $900; Pittsburg, engineers, $1,100; Providence, $1,095; New Haven, $900. p Permanent. q Superintendent of wires. m After third year. f First six months. u After six months. L About to organize one. h Hosemen.

—Mayor-elect Haines, of Minneapolis, Minn., has announced that he has appointed Edward J. Conroy as Chief of Police.

—City Attorney Lane, of San Francisco, Cal., has decided that Engineer Charles R. Murray, of Fire Company No. 2, is entitled to a royalty on his patent "hold back" which is devised for horses while descending hills with the heavy engine. The device was adopted throughout the department and Murray asks for royalty for its use, claiming that he did all the work on it outside of his employment hours.

—Mayor Davey, of Butte, Mont., has appointed his brother, Frank E. Davey, to the position as Captain of the Police to succeed Captain Ebbitts, who died recently.

—Police Commissioner Sullivan, of Dallas, Texas, is a great believer in physical culture, and he thinks that the policemen should be more expert with the fist than with the club. He has fitted up a gymnasium in one of the fire houses and there the policemen are compelled to work at the various appliances so as to keep themselves in good training.

LITERATURE ON MUNICIPAL TOPICS

Reviews of Some Important Books - What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

Books

It is always handy to have at one's command a book telling the most important dates in the history of the country, but, as a rule, it is necessary to hunt through big volumes to find any date desired. *The American Date Book,* by W. E. Simonds, will serve a long felt want for such a handbook of reference, and is sure to meet with success when once its merits are known. It is published by the Kama Company, of Hartford, Conn.

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An Historical Souvenir History of the Birmingham Police Department, Birmingham, Alabama, has been issued by Marcus Ohlander of that city. He gives a brief history of the city's growth and great increase in wealth and then takes up the police department in detail, showing how it was organized, the officers and members of the department, police commission, etc. Illustrations show the members of the force and a brief sketch of each one's life is appended. This can be had of the author for the sum of $2.00.

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The experience that the Eastern cities of the United States are having with soft coal after having tasted of the blessings of hard, is sure to bring the subject of smoke prevention uppermost in the minds of citizens. While the inhabitants of cities in which soft coal is extensively used are more or less used to its disagreeable features, the possibility of a clear atmosphere would be welcomed by all and many cities have already started campaigns against smoke. City officials who are particularly interested in the subject of smoke abolition should procure a copy of *The Prevention of Smoke* by W. C. Popplewell, for the information that is contained in this little book is invaluable to one who would learn the proper methods of ridding the atmosphere of smoke. It shows briefly what principles underlie the smokeless combustion of fuel, how the different kinds of smokeless furnaces are constructed and the results of the many trials and tests made in England to show up the good and bad points of the different classes of well known furnaces.

There are less than 200 pages in the work, but the material is presented in so clear and logical a manner that no space is wasted, there are no long technical dissertations and the numerous illustrations really illustrate the text. The author gives many simple axioms for preventing smoke. Published by D. Van Nostrand Company, New York, N. Y. Cloth, $3.50 net.

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Any history of the police systems of England will certainly be of interest to police chiefs in the United States because it shows how the Anglo-Saxon ideas of police control have developed into their present forms. On this account *A History of the Police in England,* by Capt. W. L. Melville Lee, will be read with the greatest interest by police officials in America. Capt. Lee shows how the means of preserving the peace of the realm have developed from the earliest times to the present. Starting out with the Anglo-Saxon and Norman police, he outlines the changes that occurred and shows how from a volunteer service the police force has developed into its present condition. "Watch and Ward," "Justice and Constable," and the ecclesiastical and military police are important parts of this development, and the author has presented the subjects in the most interesting and readable manner. While the subject will fill several large volumes, Capt. Lee has been able to condense it into a book of four hundred odd pages and still give the important points that are necessary to a thorough understanding of police growth. He characterizes the system as "a child of centuries of conflict and experiment." He says that, while the present methods are not perfect, the people of England to-day enjoy "no small measure of security for their property and persons, without having to submit to a host of restrictions and unreasonable formality." This book can be purchased through The Municipal Journal at the publisher's price. Price, cloth, 7 shillings, 6 pence.

The reason Mr. Gilbert J. Fowler, Superintendent and Chemist, Manchester Corporation Sewage Works, assigns for his book on *Sewage Works Analysis* is that many written requests were sent to him for an account of the methods of analyses in use in his laboratory. He has also included descriptions of some of the more important processes employed in the laboratory of the Mersey and Irwell Joint Committee. The Manchester methods are adapted for the analysis of a large number of samples of sewage and of effluents of the same general character, while those of the Joint Committee are for cases where samples of different works have to be examined. The author strikes the key note of the success of any sewage works when he says that "the successful application of modern bacterial processes will necessitate careful chemical control." Those who have charge of such works will therefore be interested in this book and should find it a source of information concerning their calling, for the methods described in these pages are those which experience has proved the best.

The book contains 135 pages, including an index, and is divided into eight chapters. The first chapter treats of "The Chemical Control of Sewage Purification Processes;" the second, third, fourth, fifth, sixth and seventh chapters deal with the determinations of "Absorbed Oxygen," "Ammonia," "Nitrites and Nitrates," "Dissolved Oxygen," "Chlorin," "Acidity and Alkalinity and Iron Compounds," and of "Solids in Solution and Suspension." The last chapter is devoted to "Analysis of the Gases from Septic Tanks and Filters." There are a number of useful tables appended to the work, such as one on atomic weights, two conversion tables, one showing the grains per gallon, quantity in 1,000,000 gallons, etc., and another for recording the quantity of sewage dealt with per given area. Published by John Wylie & Sons, New York, N. Y. Price, cloth, $2.00 net.

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Periodicals

The September issue of *The National Magazine* contains further articles under the general caption of "Progressive American Cities." In this month will be found articles by J. H. Johnson on *The City and Port of Galveston; Laconia, The City by the Lakes,* by Charles W. Vaughn; and *Nashua, The Second City of New Hampshire,* by B. E. Warren. All articles are nicely illustrated. Boston, Mass. Price per year, $1.00; copy, 10 cents.

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The September number of the *Journal* of the New England Water Works Association has appeared and contains several articles of interest to civil engineers. *How to Obtain the Best Results in Small Pumping Stations,* by Harry F. Gibbs, is the first of these articles, and it is followed by a discussion on small pumping engines. Mr. C. M. Seville presents a paper on the *Construction of a Reservoir and Standpipe on Forbes Hill, Quincy, Mass.,* giving detailed instructions as to the way the work was carried out, with illustrations showing the various stages of procedure. The *Water Works Statistics* for 1901, compiled by Charles W. Sherman, form a table of great service to all city officials having to deal with the water supply. Boston, Mass. Price, $3.00 per year; $1.00 a number; issued quarterly.

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The issue of the *Public Health Engineer* for September 13th contains several papers delivered before the Sanitary Institute. One of these is by W. F. Dearden, on *Sewer Ventilation.* Another on the same subject was delivered by Alfred M. Fowler. The issue for September 20th, has some of the other papers delivered before the Institute. *The Sanitation of Road Traffic,* by E. George Mawbey, *Means of Escape in Case of Fire,* by H. D. Searles Wood, *Some Sewage Purification Experiments,* by J. Corbet, and *Description of the New Works for the Biological Treatment of the Sewage of Manchester,* by E. P. Wilkinson, were some of those presented. This issue also contains a paper by J. Lindow, clerk of the Council at Shipley, on the *Municipal Works at Shipley.* London, Eng. Price, 3d. per copy.

THE *September* issue of The *Arena* contains an article by Adelle Williams Wright on *The Criminal Classes,* which tries to show that the present methods of dealing with criminals is wrong and a waste of energy. She divides criminals into three classes, the hardened criminals; those who by their environment are fast becoming so; the children. The first should be placed in institutions just as consumptives are treated. The abolition of the slums is the remedy for the second class. Education and changed conditions would train the parents of the third class to bring up their children in right ways. The prohibition of intoxicating liquors and the enforcement of the curfew would be important steps in the extermination of the criminal classes. New York, N. Y. Price per year, $2.50; per copy 25 cents.

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The October issue of the *Review of Reviews* has an article by Jeremiah W. Jenks on the *Philippine Constabulary and Its Chief.* Prof. Jenks, of Cornell, spent a year in the Philippines to report on the conditions there for the government at Washington, and this article is his tribute to the thoroughness and excellence of the new constabulary system in the Philippines, which is carried on under the army. *Public Parks and Pleasure Grounds* is contributed by M. O. Stone, secretary, Park Commission, Rochester, N. Y. Mr. Stone points out the values of parks and makes some valuable suggestions in regard to park finance systems, administration, harmony in design as a great object to be secured, and lastly the policing of public parks. New York, N. Y. Price per year, $2.50; per copy, 25 cents.

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The Annals of the American Academy of Political and Social Science for September contains an article on *The Present Street Railway Situation in Chicago,* by H. A. Millis. The author treats especially of the franchise problem, and states that it is far from a settlement, notwithstanding the fact that a recent election in Chicago resulted in an overwhelming vote for municipal ownership, and he sounds a warning against making demands on the corporations too urgent, because they will take refuge under an Act passed in 1865. *The Political and Municipal Legislation in* 1891 is reviewed by Robert H. Whitten, who tells what has been done in the municipalities of the country relative to changes in constitutions, uniformity of legislation, municipal home rule, etc. Philadelphia, Pa. Price per year, $6.00; per number, $1.00; issued bi-monthly.

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The discussion on *The Theory of Aerial Convection of Smallpox* is the subject of an article in *Public Health* for September. Edward Sergeant, Medical Officer of Health, Lancashire, contributes a paper on the *Provision of Hospitals for Smallpox.* Another article tells of the experiments of the *Schumberg Method of Water Sterilization,* by Henry Fraser, of Aberdeen. This method uses chemical means for freeing drinking water from pathogenic germs. In the same issue Dr. J. Robertson, Medical Officer of Health for Sheffield, tells of that city's experience in the *Prevention of Black Smoke.* Sheffield has no special powers in regard to smoke prevention, but all cases are placed under the Public Health Act which prohibits any chimney, except that of a private house, from sending forth enough black smoke to become a nuisance. London, England. Price per year, 10 shillings.

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The Proceedings of the American Society of Civil Engineers for August besides giving a full report of the business meeting, contains a paper by Theron A. Noble on *The Flow of Water in Wood Pipes.* This is treated in full from an engineer's standpoint and tables, sectional drawings and cuts show up the different features of the subject. An article that will be of interest to engineers of seashore cities is one by R. G. Allanson-Winn on *The Protection and Improvement of Seashores by the Civilization of Tidal and Wave Action.* The author shows how the powerful action of the tide can be used to protect the shore instead of destroying it. The subject should be of deep interest to those whose shore lines are gradually being eaten away by the ocean. Discussions were held at the meeting on *Separate vs. General Contracts; Relative Permanence of Steel and Masonry Construction, Irrigation Works* and *A Proposed New Type of Masonry Dam.* A full report of these discussions is given in the issue.

Municipal Reports Received

City Engineer B. T. Fendall of Baltimore, Md., has sent us his report of 1901.

We have received a copy of reports of the city officials of Alliance, O., for 1901-2.

The City Engineer of Winnipeg, Manitoba, has sent us his annual report for 1901.

A copy of the municipal reports of Portland, Oregon, for 1901 have reached this office.

Copy of the Health Officers' Report of the District of Columbia, for 1901, has reached us.

We have received the annual report of the Board of Police of Fall River, Mass., for 1901.

We have received a copy of the annual report of the Water Department of Rockford, Ill., for 1901.

John P. Prichard, Street Commissioner of Somerville, Mass., has sent us his annual report for 1901.

We have received a copy of the Year Book for 1902 issued by the Board of Trade of Springfield, Mass.

City Engineer, G. W. Sublette, of Minneapolis, Minn., has favored us with his report for the year 1901.

Assistant City Surveyor Ernest Belanger has sent us the report of the City Surveyor of Montreal, Canada.

Robert J. McCuen, Supt. Lamps and Lighting, Baltimore, Md., has sent us his annual report for 1901.

The twenty-fifth annual report of the Commissioners of Water Works of Erie, Penn., has come to hand.

The City Comptroller of Peoria, Ill., Mr. James E. Pillsbury, forwarded to us his annual report for 1901.

The compliments of Robert R. Evans, City Engineer of Haverhill, Mass., accompanies his annual report for 1901.

A copy of the fourteenth annual statement of the Street and Sewer Department of Wilmington, Del., has been received.

Thanks are due Mr. Walter E. Price, Secretary of the Illinois Firemen's Association for a copy of the Year Book for 1902.

Mr. Fred A. Snyder, City Engineer, Williamsport, Pa., has favored us with a copy of the annual report of city officials for 1901-2.

We have at hand a copy of the report of the Tree Planting Committee of the Engelman Botanical Club on "Tree Planting in St. Louis."

The annual message of Marshal Hicks, Mayor of San Antonio, Texas, and review of the reports of city officials for 1901 has been received.

David Ross, Secretary of the Bureau of Labor Statistics, of Springfield, Ill., has sent us a copy of the coal reports of Illinois for 1902.

We have received copies of the twenty-third and twenty-fifth annual reports of the Department of Public Works of Chicago, Ill., for years 1898 and 1900.

We have received the municipal manual of the city of Somerville, Mass., containing the revised ordinances. This manual is neatly bound in sheep.

We have received the forty-ninth annual report of the city of Nashua, N. H., with the compliments of Mayor M. A. Taylor and City Clerk Geo. B. Bowler.

We are in receipt of the nineteenth annual report of the Board of Fire Commissioners and Chief Engineer of Bay City, Mich., which was sent us by Chief Thomas K. Hardy.

Arthur A. Adams, Supt. of Streets and Sewers, Springfield, Mass., sent us a copy of the twenty-third annual report of the Department of Streets and Sewers, for the year 1901.

We are in receipt of a copy of the fifteenth annual report of the State Board of Health of Ohio, and also a copy of the special report on the sources of public supplies of water.

We have received the third annual message and the reports of departments of the city of Covington, Ky., for 1901, which was sent with the compliments of Mayor W. A. Johnson.

The compliments of R. Fulton Cutting accompany a "Communication on a System of Municipal Baths for New York City," which was presented to the Hon. Jacob A. Cantor by the New York Association for Improving the Condition of the Poor.

REVIEW OF MUNICIPAL REPORTS

Well-Managed Street and Water Departments—Cost of Building and Cleaning Streets Reduced by the Use of Machines—Meters Prevent Water Waste

Springfield, Mass.

We are indebted to Mr. Charles M. Slocum, City Engineer, Springfield, Mass., for his annual report for 1901. Mr. Slocum says that nearly all the paving done during the year has been done by the city. Vitrified brick has been the favorite pavement laid, although a stretch of creo-resinate wood block pavement was laid by the United States Wood Preserving Company, as an experiment. Owing to a mistake of the contractor who laid this block, a coat of pitch was allowed to spread over the surface of the wood, which rendered it very slippery. When this surface coating is worn off the full value of the wood pavement will be determined. Mr. Slocum recommends the use of American portland cement concrete and says that a large amount of it was used in laying sidewalks and curbs. Sidewalks of this material were laid during the last year for $1.34 per square yard. During the year 99,561 square yards of macadam were laid in the streets at a cost of $51,246.29.

Newark, N. J.

Mr. J. Crowell Mundy, general Superintendent of Works of Newark, N. J., states, in his annual report to the Street and Water Commissioners, that he had purchased a fire wagon and the necessary tools to make ordinary repairs to streets paved with asphalt. A grading machine was also purchased and has been of the greatest advantage for use on the unpaved streets. Over ten miles more of streets were paved in 1901 than in the preceding year. The average cost per mile of cleaning block pavement by machine amounted to $21.09, by hand $31.20 and of brick and asphalt by hand, $3.54. Over 25,600 bags of papers were picked off of the streets at a cost of $2,203. While the sewers are in good condition, they are not adequate, for, in the streets paved with asphalt, brick or stone on a concrete base, there is much trouble inasmuch as the water does not soak into the ground and the sewers are not able to carry off all the surplus. The two public baths were open to the public from May 1st to December 13th and there was a total attendance of 81,830 men and 10,585 females. Work is already being carried on on a new bath house. The Superintendent says that the appropriation for the baths is not large enough for the needs and they cannot be kept open for more than a half year. The report on electric lighting shows that there were in use last year 1,794 arc lamps and the total hours burned was 4,010.3. There were 2,074 gas lamps in use.

Madison, Wis.

The report of Mr. John B. Heim, Superintendent of Water Works of Madison, Wis., for 1901, shows that the supply is in a serious condition. At present it is from artesian wells and limited. They have a daily capacity of 1,600,000 gallons and this is nearly equalled by the consumption during hot weather. The thirty miles of macadam streets that need continual sprinkling consumes a large amount of water. He says, "only for the meter system we would be at a loss what to do." New machinery has been installed for fire protection but water is not abundant. A new source of supply is urged by the Superintendent and to save the water, he recommends that pumping stations be placed on the shores of the lakes and that sprinkling carts be compelled to go there for the water. The use of meters in the city is steadily growing with the best results. How meters have saved expenses is shown by the fact that during the last year, with 2,966 takers, an average of 541 pounds of coal was used for each taker. In 1884 there were only 699 water takers and for each taker 1,731 pounds of coal were consumed. The average per capita pumpage has fallen from 781 to 331 gallons of water. "It was a most fortunate undertaking when the city of Madison adopted the general meter system." The daily average per capita consumption for a population of 20,000 is forty-nine gallons. The rates run from 40 cents per hundred cubic feet for the first 5,000 cubic feet to 10 cents per hundred for 90,000 cubic feet and over.

Cambridge, Mass.

Mr. Charles A. Brown, Superintendent of Streets, of Cambridge, Mass., reports that for 1901 the city spent $29,999.64 on cleaning the streets. Of this amount the removal of snow and ice consumed $2,811.76. The machines that are employed in the work of sweeping have rendered excellent service, and considering the amount of work that has been done by them, are still in good condition. The cost of repairs has been comparatively small and the superintendent is of the opinion that their purchase has proved a wise investment for the city. The old brooms for the sweepers are re-filled at the city shops, and not only does this cost less than if they were done by outside parties, but much time is saved because they can be always kept filled and ready for use. The collection of ashes cost the city $28,829.82, and an appropriation of much larger size is asked for for the ensuing year for the purpose of establishing a destructor plant of improved design. During the year a portion of one of the streets was paved with waterproof bituminous macadam, as an experiment. Mr. Brown says "asphalt is a bituminous mortar pavement, consisting of bitumen and sand. Bituminous macadam is a bituminous concrete, composed of bitumen, sand and hard stone. It therefore combines the advantages of asphalt macadam and overcomes most of the objections to it, such as slipperiness, and liability to crack and disintegrate. In addition it gives a more solid and dense and therefore more waterproof and durable wearing surface than either asphalt or macadam." The Superintendent reports that the tax on the street railway, which according to an act of the Legislature, was distributed for the purpose of laying and repairing streets and sidewalks, amounted to $86,582.65 for 1901. For the last four years $210,791 were received from this source and $208,380.49 have been expended on the streets.

Rockford, Ill.

In the Mayor's message which accompanies the reports of the city officers for the year 1901, we read that prior to 1895 the city had less than six miles of macadamized streets. In that year a stone quarry was purchased at the sum of $7,000, and $6,000 has been spent on a stone crusher. The cost of producing the stone was materially reduced and a better quality of rock is being turned out for street use than ever before. A new steam roller was also purchased at a cost of $3,000. There are now over twenty-eight miles of macadam roads. City Engineer Edwin Main reports that the average cost per square yard for macadam has been $.318 and per lineal foot $1.315. The average crown given a street is from sixteen to eighteen inches for a thirty-four-foot roadway and this is giving excellent satisfaction. At the quarry 18,442.5 cubic yards of stone was crushed at an average cost of $.447 per yard. He recommends that an air compressor be put in to run the drills at the quarry as it is necessary to use a portable boiler and this is expensive. Superintendent W. N. Calkins of the Water Works, recommends that all the small mains should be replaced with large and that a larger pumping engine should be put in. The great waste of water in the city moves the Superintendent to ask that the entire city be metered. If 400 meters were purchased and placed on services at actual cost, as are the water services at present, when the money for these meters was collected, other meters could be bought, and it would not take long to equip the whole city. When done it would enable the department to "decrease the present water rates, do away entirely with excessive waste of water, decrease our pumpage expenses and fuel account," and the cost of the meters could be gradually rebated to the consumers. He estimates that 50 per cent. of the present pumpage would be saved and gives the result of several experiments that were made to test the efficiency of a meter service. Taking the entire population of Rockford there is a per capita average pumpage of over 90 gallons per day, or allowing six people to each tap, a per capita consumption per day of 128.48 gallons.

THE STORY OF THE MODERN ELEVATOR

Invented in the Early Fifties—Rapidly Brought to a State of Perfection—The Grand Canyon of New York Made Possible by the Elevator

PROBABLY no other municipal problem has received so much attention in the last few years as the question of transportation. Rapid Transit Commissioners have deliberated, the press, both secular and scientific, has devoted columns to the subject, and, finally, substantial improvements in the methods of going from place to place have impressed upon every citizen that rapid transit is the question of the hour.

The great majority of articles on rapid transit which have hitherto appeared have dealt with only one side of the question, namely, transportation horizontally. Transportation, vertically, a problem of at least equal importance has received practically no attention, except from a small group of engineers, who, by the perfection of the high speed elevator, have made possible that concentration of business and population which distinguish the great modern city.

THE FIRST ELEVATOR

The first passenger elevator worthy of the name was invented by Mr. E. G. Otis in the early fifties. In 1853, at the Worlds' Fair in the Crystal Palace in New York City, he exhibited a small elevator embodying the improvements made by him up to that time, the most important of which was one for preventing the fall of the car in case of the breaking of the lifting rope. He attracted considerable attention by standing upon the platform, running the car up some distance, and then cutting the rope, thus demonstrating the safety of his invention against accident.

In 1854, he started a small establishment for the manufacture of elevators at Yonkers and a year or two later he installed the first successful passenger elevator in New York, in the store of E. V. Houghout, at the corner of Broadway and Broome streets.

In 1859, Mr. Otis made a decided innovation in the methods of elevator operation by designing, patenting and constructing an independent engine capable of comparatively high speeds, consisting of two connected reversible oscillating cylinders to raise or lower the car. Up to that time the elevator had been regarded and treated only as one of the incidental objects for attention and service in the general distribution of steam motive power in a manufacturing establishment, being operated by belt from some conveniently located power shaft. With the direct gearing of the elevator to an independent steam engine, the era of the elevator as a separate institution of the age was ushered in.

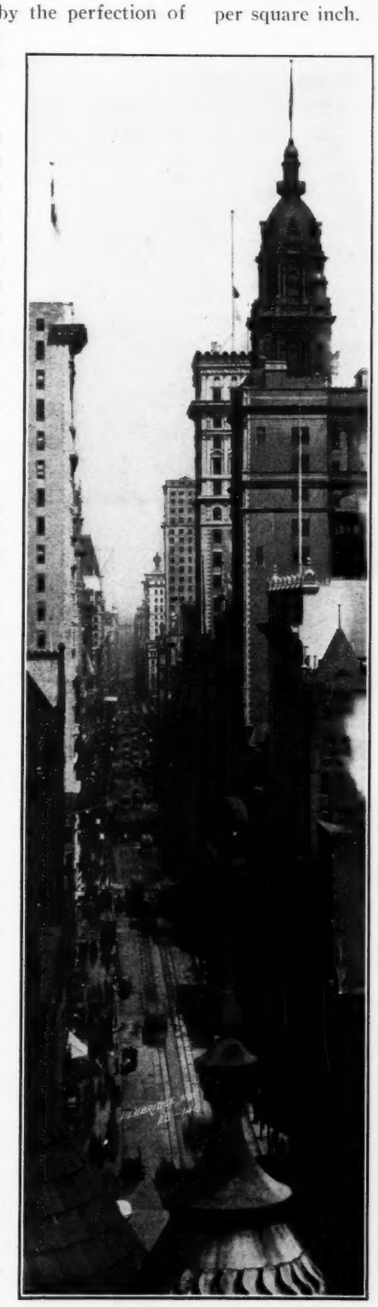
IMPROVEMENTS MADE

In 1871, the hydraulic elevator was introduced and, thereafter, was developed side by side with the steam machine. In 1888 the first electric elevator engine was built and since that time the electric machine has attained great popularity.

To-day the belt machines and the steam machines still have a certain sphere of usefulness. The high speed passenger elevators, however, are invariably either electric or hydraulic. Each type has certain advantages and the conditions obtaining in each particular case determine the type to be installed.

The elevator business, founded nearly half a century ago by Mr. E. G. Otis, has developed into the great industry of the Otis Elevator Company, with factories in a dozen cities in this country and abroad. While the Otis Company does not enjoy an absolute monopoly of the field, most of the important advances in the art of elevator building are due to its engineers, and nearly all of the larger and more notable installations have been made by that concern.

The largest number of elevators in a single establishment is in the Cupples Real Estate Company's warehouses in St. Louis, where there are eighty-five freight machines all operated from a central high pressure pumping plant. A giant accumulator of the weighted type, erected outside the warehouses, maintains the pressure at 800 pounds per square inch. To avoid interruption of the service through freezing of the pipes, paraffine oil has been substituted for water throughout the system.



GRAND CANYON OF NEW YORK

The present installation in the building of the Metropolitan Life Insurance Co., on Madison Square, consists of thirteen low pressure vertical cylinder hydraulic elevators. With the extension of the building to Twenty-fourth street, twenty three high pressure elevators and four freight elevators are to be added to the equipment and the original thirteen remodeled so that forty elevators in all will be operated from a central pumping station.

In the Prudential Life Building in Newark, there are thirty-four high pressure elevators also run from a central pumping station. For installations of hydraulic elevators, of the size of those mentioned, the high pressure system is by far the most economical in operation.

AN ABSOLUTE NECESSITY

The most notable installation of electric elevators is in the great retail establishment of Marshall, Field & Co., in Chicago, where there are forty-six machines. Some of these are for passenger service and some for freight, but the elevator engines are of exactly similar construction. They are all of the double worm type with full magnet control, placed immediately above the hatchway. In Marshall Field's wholesale establishment, are fourteen more of the same type similarly installed.

Owing to the facility of obtaining electric power, elevators in private residences are, with very few exceptions, electric. An elevator is now considered an essential part of the equipment of a fine residence. The automatic electric elevator, which is controlled by push buttons at the landings and in the car, is the most popular for this class of service.

Another Otis product is the Escalator, or moving stairway, which is particularly adapted for service in railroad terminals, department stores and other places where large numbers of people are to be conveyed from one level to another within a limited time. The most recent installation of Escalators is in the new store of R. H. Macy & Co., at Herald Square, New York. Four Escalators, each of a guaranteed carrying capacity of ten thousand people per hour, have here been installed, giving service to the first five floors.

So varied are the types of elevators that every condition has been met, whether involving the transportation of passengers or of freight.

THE RAILWAY STATION AN ATTRACTION

How One Great Railway Adds to the Beauty of the Places Along Its Line—The Needs of Each Point Considered Separately—Comfort and Convenience Always Provided

THERE are few public buildings which play a more important part in the life of a municipality than the public railway station. It is the front door of the city. Its good or bad appearance, therefore, has a material influence upon the life of the community and is responsible for the impressions of its visitors. For these reasons, any effort on the part of a great railway corporation to improve the station and beautify its surroundings is to be highly commended. It speaks well not only for the corporation, but also for the city, as a beautiful station and surroundings is an evidence of local prosperity.

"A striking illustration of a railroad making its stations bright," said a writer in a recent issue of the New York *Tribune,* "attractive and comfortable, for its suburban passengers is afforded on the Harlem Division of the New York Central. In the course of the last few months six stations have been erected on this line, each of which is built and furnished with special regard to the needs of the commuter. These stations are at Tuckahoe, Scarsdale, Kensico, Hawthorne, Pleasantville and Chappaqua.

"Unlike the custom of some railroads, which adopt a certain type of building and then build all their stations according to this plan, the New York Central has built each of these stations of different design. The efforts of the architects, Reed & Stem, working under the supervision of Chief Engineer Wilgus, have been to construct buildings in harmony with the surrounding landscape.

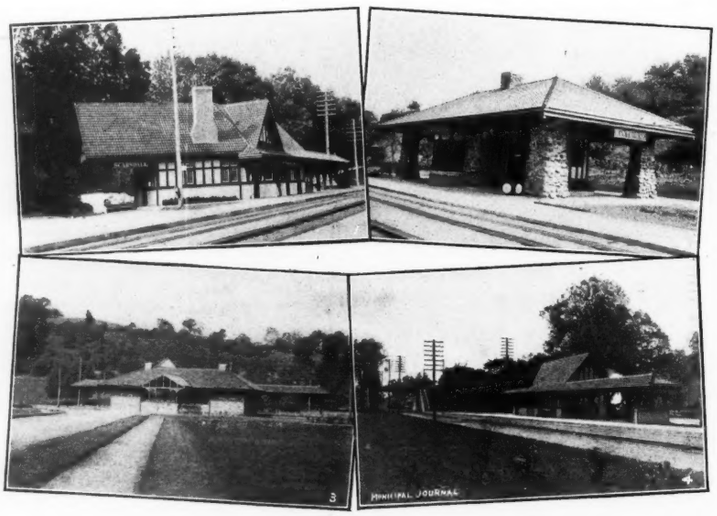
"Photographers were accordingly sent out and instructed to take pictures of the surrounding country where it was proposed to build. The plans for the new station in each case were then drawn on the photograph. Where the land to be built upon lay alongside of a hill the station was made long and narrow. Where it was to be erected in an open space it was made more nearly square, so as to stand out by itself. In some points of architectural style all the new buildings resemble each other. They all have tile roofs of green or red color. Within is a general waiting room, from which both the ticket office and the baggage room are accessible, so that passengers can attend to these details without going outside. The floors are of terrazza, made of cement and marble chips, which can be scoured to a nicety of cleanliness. To prevent the traditional abuse of using the space under the seats into which to throw cigar stumps, paper bags, banana peels, apple cores, peanut shells and other articles of a similar character, the floor is bent at a curve of 90 degrees and brought up even with the edge of the seat.

"Instead of the oldtime baseburner in the middle of the waiting room, which is either red hot and suffocating the passengers with carbonic acid gas, or stone cold, surrounded by a chattering group of blue-nosed commuters, there are radiators heated by steam from a basement furnace. There is no plaster, for the walls are of enamelled brick, of various tones, with timber work to match.

"For the comfort of the women passengers in all of these new stations there are cosey retiring rooms, furnished with oak chairs, a lounge, cheval glass and other accessories for the mysteries of a woman's toilet. In the Chappaqua station there is also a smoking room for men.

"All the stations with the exception of those at Kensico, Scarsdale and Tuckahoe, are built of field stone taken from the immediate neighborhood, and the bowlders are mortared together according to a design without pattern. The stone varies in color from red to gray. The Scarsdale station, however, is built of cement, which is used as a base, surmounted by chestnut panels, which are framed about interstices of plaster, with English gables and chimneys of red brick and cut stone. The station at Tuckahoe is built of buff colored brick, with terra cotta trimmings. The station at Hawthorne developed out of a plan for a mere train shed to afford protection from inclement weather. As a result a fanciful structure was evolved, of unique design, with a cosey suite of rooms and a long, projecting roof resting on rustic pillars.

"What adds much to the majority of these suburban stations is their park approach, which is replenished each spring with plants from the New York Central's hothouses at Poughkeepsie and Batavia. The plots are cared for throughout the summer and kept verdant and attractive. What promise to be the most attractive station grounds on this division are at Chappaqua, where a park of five acres has been laid out on land once owned by Horace Greeley and given to the village by the Rev. Dr. F. M. Clendenin. The station and park were opened on June 14 with appropriate exercises.



VIEWS OF SOME OF THE ATTRACTIVE NEW STATIONS ALONG THE NEW YORK CENTRAL

"The building of these new stations has been only a part of the work of improvement on the Harlem Division of the Central. At the same time that these structures have been erected men have been at work on the roadbed, and have now completed a double track as far as Mount Kisco. Here a new station would now be standing also had not the proposition been delayed by a local dispute over its site."

In its effort to adapt the architecture of its stations to each particular locality, the New York Central is setting an example which cannot be followed too often by city officials everywhere. Small towns and cities, particularly in the West, can do a great deal toward promoting civic beauty by giving attention not only to the large but to the small matters of detail. For instance, in the location of a monument, a fountain, a statue, or the adornment of a small square or triangle, either by tree, shrub or floral plantations, the surroundings, in each case, should be duly considered and an attempt made to adapt the improvement to its locality. It would be very wise on the part of municipalities to co-operate with the railways which pass through their limits in beautifying the streets or area contiguous to the railway station. Here is where the traveler who passes through, gains his impression, which is either good, bad, or indifferent, of a community. The streets leading from the station should be beautified, and the territory on either side of the track as it traverses the town should be improved. There is little doubt that the railway company would meet the city more than half way in making these improvements.

Iowa City Officials Meet

THE fifth annual meeting of the League of Iowa Municipalities was held at Iowa City, October 8th. There were 75 present. The meeting was presided over by Hon. W. H. Wray, Mayor of Oscaloosa. Mayor F. K. Stebbins, of Iowa City, welcomed the guests. Hon. F. G. Pearce of Marshalltown, Secretary and Treasurer of the League, presented his report and he was followed by Henry Theunan, of Davenport, who read the report of the Committee on Legislation. Hon. F. M. Morris, Mayor of Mason City, read a paper on "Street Paving in Iowa," and the Hon. A. P. Hoagland, Councilman of Ottumwa, presented one on Street Cleaning and Sprinkling."

The report of the Committee on Sewerage and Sanitation was presented by the Hon. P. M. Plumb, Mayor of Marion, and the Hon. P. J. Martin, Mayor of Waterloo, presented the report of the Committee on Franchises.

Prof. A. Marston of the Iowa State College read a paper on "Some Recent Sewage Disposal Plants in Iowa," and Prof. Calvin of the State University spoke on "Sources of Artesian Water Supply for Iowa Cities." Mayor Schooley of Indianola gave a talk on "Governing of Municipalities."

General Stone's Steel Highway

DURING the last month a sample sketch of new pavement was laid in one of the heavily traveled streets of New York. This is the steel rail highway with which General Roy Stone has been experimenting for some time. These steel rails will be laid in pairs so that their inner edges will be less than the minimum wagon track distance apart. They will be of three-eighth-inch steel, one foot in width, and along the edges will be a ridge about half an inch high, so as to keep the wagon wheels along the rail itself, although not high enough to prevent its easily turning out. These rails will have perpendicular sides three and one-half inches deep, and will be riveted together by fish plates. They will be laid in forty-foot lengths, weighing 1,000 pounds each and will be imbedded in gravel laid on crushed stone to a depth of eighteen inches. The fish plates binding the sides have slot holes so that in the expansion of the rails the bolts can slide in the slots. A distance of five-sixteenths of an inch is allowed between ends to permit of expansion and three-quarter-inch tie rods will bind the rails together. These will be placed every thirteen feet. The United States Steel Corporation donated the rails, which are to be laid under supervision of Borough President Cantor and the Automobile Club of America. General Stone places the cost of this style of highway at about $4,000 a mile.

Convenience Station for San Francisco

As a result of persistent effort on the part of the Merchants' Association, the city of San Francisco will have, in the near future, one of the most complete convenience stations to be found in the United States. It will be the first of its kind on the Pacific Coast, and it is hoped by the Association that additional structures will be provided by the city and that this good example will be followed by other municipalities in the West. This project has been under discussion for more than four years. In 1898 the President of the Association, at that time Mr. W. F. Dohrmann, started the movement in the hope of having the city provide the station for itself. As the civic authorities did not seem inclined to build the station, the Association finally decided to construct it at its own expense and present it to the Park Commissioners of the city. A formal declaration of this proposition was made last October, in which it was offered to build an underground public convenience station, costing $5,000, on condition that the Board of Park Commissioners would properly care for it, such maintenance to include a woman janitress in constant attendance in the woman's department.

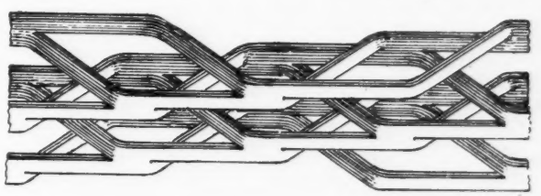
The interior walls are to be lined with white, glazed brick, floors to be of tile and the partitions of the closets to be of white marble. Everything about the station is to be first-class and of the most approved design.

During the day the station will be lighted from a skylight, while during the dark hours, incandescent lights will illuminate it.

The approaches to the station are to be hidden partially by the shrubbery of the park in which it is located, and as far as possible it will be concealed from public view.

Fireproofing of Buildings

IT has only been within the past decade that American cities have begun to be more particular about building regulations. In that period there have been evolved various methods for fireproofing construction which have met with the approval of building inspectors and met the rigid conditions laid down by the law. Among these may be included Kuhne's sheet metal structural elements, as manufactured by the Truss-Metal Lath Company, 40 Gold street, New York. This is a superior, practical and durable method for fire-proof construction. It is a fact, well known to engineers, that concrete, or



WHAT TRUSS-METAL LATH LOOKS LIKE

lime and cement mortar, are among the best preservatives of iron or steel against corrosion. The expansion and contraction of steel and concrete are nearly equal, and the porous, cold, hard cinder concrete is one of the best fire retardants known.

It has been demonstrated also that poured concrete, sufficiently wet, will leave no voids. It makes a preferable material in connection with re-inforced steel. The adhesion of the steel is perfect, and the steel receives a coating from the cement which is a better preservative than the paint.

The Truss-Metal lath is used for partitions and ceilings, floors, trunk sewers, tanks, etc. A descriptive, illustrated catalogue will be sent to any address desired.

Municipal Use of Gas and Kerosene Engines

THE gas engine has been in use so many years that it has long since passed the experimental stage. It has only one limitation, namely, it is confined to those localities where it has access to gas, either artificial or natural. The invention of an engine adapted to the use of kerosene as a fuel, and also manufactured by the Mietz and Weiss Company, 128 Mott street, New York City, has removed this limitation, so that the engines of this type may now be used without hindrance, in all quarters of the globe.

As might be expected, the demand for an engine using kerosene as a fuel increases daily. Like the gas engine, it is so simple in its construction, and so perfectly automatic in its action that any person, even though unfamiliar with the use of machinery, can readily learn to operate it. It is generally believed that the responsibility should rest with the mechanism rather than with the user of a kerosene engine.

The recent coal strike has demonstrated that the use of coal as a fuel cannot always be relied upon. The manufacturer who may use large quantities of fuel for producing power is left too much at the mercy of the coal miner. The use of the gas or kerosene engine would be a most practical safeguard against loss in this direction.

Another point in favor of the gas and kerosene engine is that the consumption of fuel is proportionate to the work done by the engine, the less power used the less fuel consumed. To determine the running cost of either gas or kerosene, it is well to ascertain the average work the engine is to do, expressed in horse power, and on that basis the calculation, taking into consideration the quality of the fuel used.

There is no reason why small towns and village water works should not operate their pumping stations at a nominal cost. The experience of other towns, and even large cities, where the gas and kerosene engines have been in service for many years, demonstrates the feasibility of the plan.

This Filing Cabinet Makes Life Easy

Most city officials like to save many clippings from newspapers and magazines, but they do not always have an efficient method of filing and classifying them, so that they can always place their hand on the clipping desired. Usually all such matter goes into a drawer where it accumulates until it is finally dumped into the waste paper basket because it is not possible to refer to it quickly. The filing cabinet made by the Library Filing Cabinet Company, Title and Trust Building, Chicago, Ill., is designed to fill this special need of city officials.

He is an unwise man who makes no preparation for his business. Time is too valuable to waste in hunting for what ought to be at immediate command.

Nearly every man who has made his mark in the world has been a man who has been able to gather information and store it away in such a manner as to be able to bring it forth when occasion demanded. Every city official and professional man feels the need of some convenient, well-regulated store house arranged to bring order out of chaos with the vast fund of information that the printing presses are giving forth.

There may be only 5 per cent. of your month's reading that you would care to preserve, but these choice bits you wish for future reference, and the editor knowing by experience himself the value of having matter for ready reference takes this opportunity to call the attention of his readers to this filing cabinet.

In these days of the "strenuous life," knowledge consists in having filing cabinet and putting the thing away where you can lay your hands on it when needed. The successful man is he who knows where things are.

A Crushing Plant for Macadam Roads

The cities of New England are wiser in their day and generation than are most other municipalities in the country. They make a dollar go further than the average city. Economy and prudence may have been inherited from the Puritans, but whatever their source the example is a good one to follow. Authorities of large and small municipalities, throughout New England, for years have been noted for their economical methods in the construction and maintenance of streets and highways. More portable stone crushers and permanent plants built on a larger scale will be found within New England territory than any other equal area in the United States. In Connecticut and Massachusetts, particularly, the highways have been greatly improved. For instance, the city of Newton has its own crushing plant, which has been in operation for years, and as a result not only are the streets of the city well macadamized but the roads leading from the city are carefully improved. This is made possible by the economical use of this plant. There is an abundance of good trap rock in a quarry not far from the limits of the city, at which is installed an up-to-date plant, similar to those constructed by the Allis-Chalmers Company of Chicago, the well-known manufacturer of rock crushing plants, both portable and permanent. This company has installed permanent plants in many municipalities in the United States, besides selling a large number of portable plants for the same use. For further particulars about the plants manufactured by this company we refer our readers to its advertisement found elsewhere in this number.

There is no public improvement more popular to-day than that connected with the construction and maintenance of a better highway system. The good work is being pushed along by many national, state and town good roads associations. All classes of people are interested in the work, the rich and the poor, the farmer and laborer, the bicycle rider and the one who walks; for all alike can, and do appreciate a well built and maintained thoroughfare.

This movement means that the farmer can transport his produce to market over a good road at less expense than over a poor road. This is a fact which is being repeatedly demonstrated, and a larger number of people are coming to recognize it as a good argument why the roads should be improved. If it benefits the farmer in this way it cannot fail to benefit every one who uses the public highways. Therefore, every municipality should promote the work by investing in a stone crushing plant adapted to its needs, to be used both for the improvement of its streets and the main highways leading into it. A better investment could not be made.

The New Studebaker Building

The business of the Studebaker Brothers Manufacturing Company, South Bend, Ind., continues to develop at a rapid rate. It will complete, before long, in Kansas City, an immense new building to assist in handling the Western trade.

This new structure will be eight or nine stories high above the basement on a plot of ground 116 by 127 feet, having in all about 14,000 square feet of floor, 60 per cent. of which will be occupied by the Studebakers and the balance rented to other tenants. It will

be equipped with fire-protecting devices, automatic sprinkler, elevators, and everything which a modern building should have to contribute to the comfort of its tenants.

In addition to this extensive improvement in Kansas City, the Studebakers are putting up a ten-story building, of steel construction, fire-proof, in New York City. These improvements indicate a thrifty business and enlarged possibilities for extending their already enormous trade. This means also that municipal orders will continue to be promptly filled, and if possible, even a better service guaranteed in the future that in the past.

A Mountain of Baggage

Few persons appreciate the tremendous passenger business that is being handled by the railroads. Here is an illustration that will open the eyes of some:

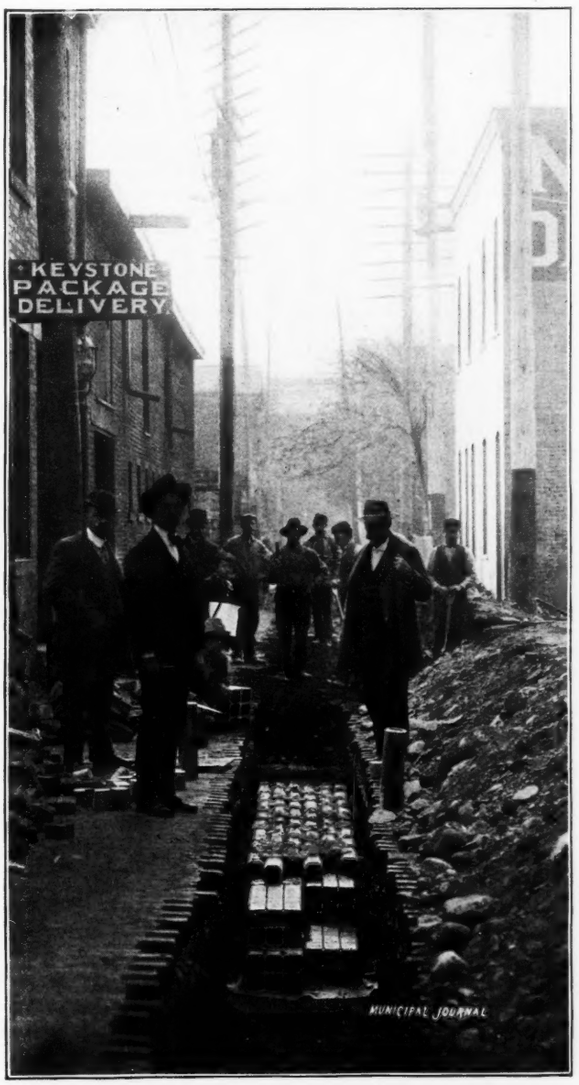
For the first six days of September there were received at the New York's Grand Central Station, New York, 34,259 pieces of baggage, an average of 5,700 pieces per day. During the second week of September the average was a little over 3,000 pieces per day. The baggage came in so rapidly and there was such an amount of it to be handled in a comparatively small space that it was with the greatest difficulty that the platforms were kept clear for incoming trains.

The first week in September is always the heaviest week in the year; so many people returning on the first of September from the Lake and Mountain resorts, in order to put the children in school, that it makes an immense traffic. The fact that this great amount of baggage was handled with reasonable promptitude, and that very few trunks were either lost or seriously damaged, speaks volumes for the efficiency of our transportation lines.

More Wires Put Underground

ANOTHER Pennsylvania municipality is entitled to a place on the roll of honor, for completing a conduit for placing wires underground in its business section—Newcastle, Penn.

Reagan and Mulock, of Philadelphia, received the contract for laying the conduit. In Newcastle they laid the conduit in alleys, as often as it was possible, so as not to disturb the good streets. The vitrified underground conduits used for this work were manufactured by the Standard Vitrified Conduit Company, 39 Cortlandt street, New York. In describing the work done in Newcastle, Alderman Mulock said, "The sections of the conduits are covered with a strip of burlap about eight inches wide, which is then covered with pitch. This makes the joints perfectly tight and the conduits impervious to water.



"The conduit consists of thirty departments, which are laid in sections of six, and when ready for use the space in the sections will be rented at so much per duct foot.

"The work is done for the city and the system will be owned and operated by the city. All telegraph, telephone, and electric light companies operating within the city limits will be compelled to place their wires underground, and therefore will be compelled to rent duct space from the city. The city will get its return for the cost of the installation of the conduit in the annual rental paid by the several companies, and it is expected the municipality will receive a small net revenue from the investment."

The home city of Alderman Mulock—Atlantic City—is now considering the carrying out of a similar undertaking. The Atlantic City *Daily Press* referring to the matter editorially, recently said, "The proposition made by Alderman Mulock that all telegraph, telephone, electric and other wires be put underground will be indorsed by all. He says that the work of providing conduits can be done by the city, and the rentals therefrom will more than pay the first cost, and bring in good annual returns in the future. The financial consideration is small when compared with the great good otherwise accomplished. A great danger from fire is thus removed, and the city in general is benefitted by the taking away of a regular net work of wires.

"Council cannot take this question up any too soon. By next summer the wires could be buried, if prompt action is now taken."

The recent great fire in Atlantic City is said to have been caused by the falling of overhead electric wires on telephone wires. It is expected that the municipal authorities of Atlantic City will soon take action upon the matter and so add another city to the roll of honor.

Notes of Interest to the Trade

—Mr. Norton P. Otis, the chairman of the Board of Directors of the Otis Elevator Company, has been elected to Congress upon the Republican ticket from the 19th Congressional district.

—The city of Elyria, Ohio, which takes its water supply from Lake Erie, is soon to have a filtration plant of 2,000,000 gallons per day capacity. It will be installed by the New York Continental Jewell Filtration Company.

—At the Düsseldorf Exhibition which has just terminated, the highest award of merit, the gold medal, was awarded the "Hunt" Conveyor. This conveyor is manufactured by the C. W. Hunt Co., West New Brighton, New York.

—The Ellithorpe Safety Air Cushion Company recently tested one of its cushions in the Patent Office Building, Washington, D. C. The elevator car dropped a distance of fifty feet without injury to the contents of the car, which included among other things, a live monkey.

—The Pittsburgh Filter Manufacturing Company, Empire Building, Pittsburgh, Pa., has had an unusually busy year installing water works filters and water softening plants. Besides constructing the largest water softening plant in the world—2,500,000 gallons capacity—for the Tennessee Coal, Iron & Railway Company, of Birmingham, Alabama, it has installed about a score of other plants in different parts of the country.

—The United Engineering and Contracting Company has completed the temporary bridge over Newtown Creek, which is preparatory to the installation of the "Scherzer" roller lift bridge. As a result of installing this modern type of bridge, there is now for immediate sale a perfectly good hand power, centre swing, highway bridge, with double trolley tracks in place, to any one who may need such a structure for quick delivery.

—Fire Commissioners, Fire Chiefs and others interested will be glad to learn that the Diggs Fire Extinguisher Co., 141-143 Centre street, New York City, is now building all sizes of extinguishers and chemical engines, of the Diggs upright type, from one and one-half to fifty gallons capacity. The company will be pleased to submit estimates for single or double tanks for any kind of a truck. A branch office has been opened at 1113 Arch street, Philadelphia, with Mr. G. S. Riker in charge.

—The Associated Engineering Company, 277 Broadway, N. Y., with Joseph Caccavajo as Chief Engineer, has recently been organized. The function of this company is, generally speaking, to deal with any and all problems of progressive engineering and construction. Associated with the company as consultants are engineers of the highest standing in every branch of the profession, including architects, builders in masonry and steel, accountants and lawyers skilled in contract, commercial, and professional law.

—Those of our readers who have trouble with scale in their boilers will be interested in the following letter from Mr. J. Frank Post, of North Newark, addressed to the New York Continental Jewell Filtration Company, Mills Building, New York: "I have opened my boiler after using the water that was treated with your Water Softener for ten weeks and am very well satisfied with its working. No scale formed in this time; old scale one-half inch thick letting loose. My boiler will be entirely clear of scale in the course of six months."

LATEST NEWS FOR CONTRACTORS

Bids Wanted for Municipal Work—Franchises Granted—Contemplated Improvements—Contracts Awarded

PAVING

Wilkes-Barre, Pa.—The Council has been considering the issue of $156,313 worth of bonds to pave all streets with brick.

Washington, D. C.—The Commissioners will ask Congress to appropriate $44,600 for paving in various sections in 1903.

Syracuse, N. Y.—The Council will order the paving of Grape street with sheet asphalt or brick. City Engineer Schnauber.

Washington, D. C.—The cost of macadamizing Nichols avenue was placed at $18,000.

Belleville, N. J.—The cost of improving the Belleville turnpike for three miles was estimated at $55,000. Board of Freeholders.

Pittsburgh, Pa.—Director of Public Works McCandless will recommend that a large amount of paving be done next year.

Norwood Park, Ill.—The cost of paving the principal streets has been placed at $75,000.

Cincinnati, O.—Plans and specifications for improving Hackberry street with brick and Park avenue with asphalt have been made by City Engineer Stanley.

Hamilton, O.—A petition has been presented to the Board of Control asking for the paving of South Front street.

Logan, O.—In the spring 18,000 square yards of vitrified brick paving will be laid.

Indianapolis, Ind.—20th street will be paved with asphalt at a cost of $22,850. Board of Public Works.

Dallas, Tex.—It is stated on local authority that the Consolidated Street Railway Company will spend $67,000 in paving between its tracks.

Louisville, Ky.—It was recently voted not to issue $3,250,000 municipal bonds for street and sewer construction.

Brooklyn, N. Y.—Plans for the widening of Livingston street have been prepared by Engineer Tillson of the Highway Department.

Fredericksburg, Va.—Reports state that $25,000 was voted for street paving.

Portsmouth, Va.—The Council has been considering the expenditure of $100,000 for paving.

Charlotte, N. C.—The question of paving the streets has been under consideration.

Toledo, O.—Bids are wanted December 1st for paving Darr street. City Clerk Nauts.

Delphi, Ind.—Bids are wanted December 1st for improving the Burlington & Cutter gravel road. Henry Wagoner, Commissioner.

Owosso, Mich.—West Main, South Washington streets and Michigan avenue to be paved at a cost of about $30,000.

Lead, S. D.—The bids for paving the principal streets were too high and will probably be re-advertised.

Winnipeg, Manitoba.—The Council may asphalt George avenue, macadamize Colony street and build granolithic walks on George street, etc.

Latonia, Ky.—It was voted recently to issue $30,000 in bonds for improving the streets.

Union Hill, N. J.—The Council has decided to improve New York avenue, but will not begin work until next spring.

Quincy, Mass.—Local reports state that the Council is considering the improvement of the streets.

Swansea, Mass.—It is stated that $6,000 was appropriated to construct a new road.

Niagara Falls, N. Y.—It has been decided by the Council to pave Niagara avenue.

East Orange, N. J.—The Park Commissioners have been voted $1,000,000 to extend the parkway system.

Toledo, O.—Bids are wanted December 1st for improving Wayne street. City Clerk Nauts.

Lafayette, Ind.—The plans of Engineer Vawter for brick pavement on State and Ellsworth streets and asphalt on others, were approved by the Board of Public Works.

Grand Rapids, Mich.—The Council is considering the repaving of State street.

Norwood Park, Ill.—It was recently decided by the City Council to pave a number of streets at a cost of $75,000.

Springfield, Ill.—The paving of several streets has been favorably reported by the Street Committee.

Seattle, Wash.—The City Engineer's estimates for concrete sidewalks on several streets aggregate about $50,000

Savannah, Ga.—An ordinance has been passed for the paving of 36th street with brick. City Clerk.

Gloversville, N. Y.—It is stated that about 17,000 square yards of macadam and 8,000 square wards of brick pavement will be laid in 1903. City Engineer Vrooman.

Baltimore, Md.—Bids are wanted December 3rd for the grading, curbing and brick paving of Northwest street. City Engineer Fendall.

Pittsburg, Pa.—A resolution has been passed appropriating $40,000 for repaving North Negley avenue and $9,500 for Stanton avenue.

Newark, N. J.—Campbell street may be paved with concrete block or asphalt. Board of Public Works.

Milton, Pa.—An election will be held February 17th to vote on the issue of $12,000 in bonds for the purpose of a stone crusher and steam roller.

York, Pa.—An ordinance has been passed for the macadamizing of Biddle street.

Woonsocket, R. I.—An appropriation of $44,000 for highway purposes has been considered by the Council.

Meriden, Conn.—Colony street will probably be paved, the cost being placed at $14,000 for asphalt and $10,000 for macadam.

Windsor, N. Y.—Chairman Back, of the County Board of Supervisors, Binghamton, has received plans for improving four and one-half miles of road in Broome County.

Pittsburg, Pa.—Bids were asked November 29th for the purchase of $550,000 bonds for improving the public roads, highways, etc. County Controller Thompson.

Brooklyn, N. Y.—The residents of 65th street petition that it be paved with asphalt at a cost of about $50,000. Borough President Swanstrom.

Des Moines, Ia.—Bide are wanted December 2d for 9,621 lin. ft. cement curbing and for 4,851 sq. yds. of one course of brick paving on 6-inch concrete. University avenue, 35th street and Forest avenue—40,000 sq. yds.—may soon be paved with brick or asphalt at the cost of about $150,000. Board Public Works.

Easton, Pa.—The Council may soon issue $300,000 bonds for improving the streets.

Crafton, Pa.—Bids were asked December 2d for $25,000 bonds for improving the streets.

Toledo, O.—Bids are wanted December 9th for $125,000 bonds to be used for improving the streets. Co. Auditor Wylie.

Toledo, O.—Bids are wanted December 8th for block paving on 6-inch concrete on Wayne street, including curbing, etc. City Clerk C. H. Nauts.

Springfield, Ill.—It has been decided by the Council to pave Cooke, Spring and Edwards streets with brick on concrete.

Pipestone, Minn.—A committee has been appointed to investigate the advisability of purchasing a stone crusher. Ald. C. W. Gilmore.

Owosso, Mich.—The issue of $30,000 paving bonds was voted at the recent election.

Wapakoneta, O.—$30,000 highway bonds were recently sold.

Fort Dodge, Ia.—The asphalting of two and one-half miles of streets has been decided upon.

Lindsay, Ont.—The citizens of Lindsay have been thinking of spending $300,000 on street improvements.

Salem, Mass.—Plans for building the Lynnfield Road have been prepared byCharles Gay, of Lynn.

Newport, R. I.—It was voted recently to issue $50,000 in bonds for macadamizing Broadway and Spring streets.

Swarthmore, Pa.—The Council will issue $20,000 in bonds for improving the streets.

Glenville, O.—The street commissioners will pave St. Clair street. Village Engineer Boalt.

La Crosse, Wis.—Next year 15th street will be paved with brick. There will be twenty blocks of the brick and fifty blocks of granite top dressing.

Red Oak, Ia.—The Council has decided to pave West First, Second, and Third streets.

Hannibal, Mo.—Plans for the paving of North Third street have been prepared by City Engineer Buetter.

St. Joseph, Mo.—The improvement of Tenth street is under consideration by the Council.

Guthrie, O. T.—Bids are wanted December 11th for paving streets with brick. City Clerk Sendelbach.

Dallas, Tex.—The City Council has been considering plans for the repaving of Main street. City Engineer Raines.

Portland, Ore.—New bids will be asked for the improvement of Failing street. Board of Public Works.

Oakland, Cal.—City Engineer Turner has made plans for the improvement of the park which is to cost about $15,000. The paving of San Pablo avenue is placed at $106,700.

Ogden, Utah.—Washington avenue will be paved at a cost of $25,000. City Recorder Chrichlow.

Belvidere, Ill.—It is stated that this city is to purchase a stone crusher and steam road roller.

Ironton, O.—Bids are wanted December 6th for the purchase of $12,000 street bonds.

La Crosse, Wis.—The special Street Committee has recommended that numerous streets be paved with brick and macadam in 1903.

Atchison, Kan.—The Council has adopted a resolution declaring it necessary to grade and pave with brick, etc., 11th street. About 9,781 sq. yds. of paving is involved.

St. Louis, Mo.—It was recently ordered by the Council that Broadway be repaved with asphalt.

(Continued on page 24.)

Tuskegee, Ala.—It was voted recently by Macon Co. to issue $100,000 bonds for good roads.

Oakland, Cal.—The cost of improving the boulevard on the shore of Lake Merritt has been placed at $185,000 by City Engineer Turner. There will be 360,720 sq. ft. macadam, over 21,000 lin, ft. of granite curbing, cement work, gutter, etc.

Montreal, Quebec.—Alderman Laporte, Chairman of the Road Department and Finance Committee, states that in 1903 every macadamized road will be repaired, every asphalt pavement put in order, Commissioners, Commons and St. Paul streets to be paved with granite blocks, as well as streets about Victoria Square.

Dallas, Tex.—Plans have been prepared for re-asphalting Main street.

Beaumont, Tex.—It was recently voted to issue $95,000 in bonds for paving. This is in addition to the $125,000 worth of bonds already issued.

St. Joseph, Mo.—A plan is under consideration for the asphalting of all the unpaved streets of the city.

Green Bay, Wis.—Bids are wanted December 11th for improving several streets. City Clerk W. L. Kerr.

St. Paul, Minn.—The cost of paving West 7th street is placed at $76,000, and property owners will be asked to share the expense.

Grand Rapids, Mich.—The cost of asphalt block paving on concrete with a five year guarantee, for Wealthy avenue, has been placed at $65,243; for sheet asphalt, with ten year guarantee, and a two foot concrete gutter, the cost is placed at $55,313, and for brick paving on concrete, $4,511. City Clerk.

Cincinnati, O.—The cost of brick paving on Dorsey street is estimated by City Engineer Stanley at $13,586. A petition asked for the asphalting of Fifth street.

Kalamazoo, Mich.—Various kinds of paving are being considered by Commissioner of Public Improvements John J. Knight, with a view to considerable paving in the coming year.

Iowa City, Ia.—The cost of paving Linn street is placed at $23,331. It includes 11,690 square yards of brick, 4,413 feet of curbing stone, water inlets, etc. Engineer Magowan.

Weston, O.—At the election held November 4th it was voted to macadamize the roads of Weston Township. Town Clerk Henderson.

Evanston, Ill.—The Board of Local Improvements has been asked to pave Dempster street with macadam. City Engineer J. H. Moore.

Charlottesville, Va.—At the election on November 4th the $80,000 in bonds for street improvements were defeated, but an election will be held December 19th for a re-vote on the proposition.

LIGHTING

Mahanoy, Pa.—A franchise has been granted the Mahanoy City Light, Heat and Power Company.

Baltimore, Md.—The election recently held authorized the issue of $1,000,000 in bonds to extend the subway system for underground wires.

Altamont, N. Y.—The Altamont Illuminating Company has been incorporated at $5,000 to supply gas and electricity in neighboring towns. E. B. Crannell, Director.

Vincennes, Ind.—The Vincennes Electric Light and Power Company has received a twenty-five year franchise.

Alton, Ill.—The Alton Railway, Gas and Electric Company will lay 15 miles of gas mains. President J. F. Porter.

Akron, O.—A franchise for a steam heating plant has been asked by John Lamparter.

Rockford, Ill.—A franchise for an electric light plant has been granted J. A. Walter of the Central Heat and Power Company.

Barnesville, Minn.—It was recently voted to issue $7,000 worth of bonds for a power house and new machinery for the village electric plant.

Chattanooga, Tenn.—A contract for lighting the city for two years was let the Chattanooga Light and Power Company.

Temple, Tex.—The City Council was recently asked to grant a franchise for a steam heating plant to J. F. Smyther.

Hattiesburg, Miss.—The Hattiesburg Light and Power Company, with a capital of $30,000, was granted a charter. H. A. Hemphill.

Carrington, N. D.—A franchise for an electric light plant was let the Western Electric Company of Jamestown.

Sterling, Colo.—A franchise for lighting the city with electricity for twenty years was granted O. P. Sells, Pueblo.

Portland, Me.—The American Heat, Light and Power Co. is the new name for the United States Heat, Light and Power Company, and the capital stock will be increased to $6,000,000.

Van Buren, Me.—The construction of an electric plant has been under consideration.

Hyde Park, N. Y.—The lighting of the village with electric lights has been desired by the residents.

Niagara Falls, N. Y.—The Ontario Transmission Co. has a franchise for supplying the city with a small amount of electrical horse power.

Hawley, Pa.—The United Water Power Improvement Co. will construct a 1,000,000 water power electric plant. Manager C. J. Young, 3718 North Carlisle street, Philadelphia.

Norfolk, Va.—Bids are wanted December 4th for furnishing a dynamo, engine, switch board, etc., for the electric plant at Fort Monroe. U. S. Engineer's Office.

Jonesboro, N. C.—The Campbell Electric Light and Power Co. has a franchise for lighting the streets with electricity.

Scranton, Miss.—The electric light and water works plant will be sold to L. S. Anderson for $25,000.

Pass Christian, Miss.—The Pass Packing Co. has a contract for lighting the streets with electricity.

Columbia, N. Y.—The Central Electric Power Co. of New York is making surveys for a water power plant.

Columbia, Pa.—Plans for a power house for the Schuylkill Valley Illuminating Co. have been completed. L. R. Perct, Arcade building, Philadelphia.

Reading, Pa.—An electrician will be employed to estimate the cost of a municipal electric light plant.

Concord, N. H.—Burton & Scott, Richmond, Va., will erect a $75,000 plant.

Washington, N. C.—Stephen C. Brogan has a franchise for an electric light and power plant.

Barnesville, Ga.—A vote will be taken December 2nd on the issue of $10,000 worth of bonds, part to be used for improving the electric light plant.

Hawkinsville, Ga.—The Hawkinsville Cotton Mills will improve the electric plant recently purchased.

Barton, Fla.—It was recently voted to issue $15,000 worth of bonds for an electric plant and sewers.

Miami, Fla.—A new electric light plant is to be constructed. Hon. John B. Riley.

Quincy, Ill.—The Quincy Steam, Heat and Light Company has asked for a franchise to build an electric light plant.

Detroit, Mich.—The Sault Ste. Marie power plant will supply Detroit with electricity.

Janesville, Wis.—The Janesville Electric Co. has a new management and will be improved.

Wauwatosa, Wis.—Plans for an electric light plant have been made by H. D. Hallett, Aurora, Ill.

St. Paul, Minn.—The Board of Public Works wants an appropriaion of $180,000 for lighting the streets in 1903.

Ballad, Wash.—A franchise for an electric light plant has been asked by the Snoqualmie Falls Power Co.

Exeter, N. H.—The Philips Exeter Academy will erect a lighting plant on Water street.

New London, Conn.—The New London Gas & Electric Co. will greatly increase its lighting plant.

South Norwalk, Conn.—Bids will be asked soon for enlarging the municipal electric plant and for equipping the plant with three hundred meters. A 250-H. P. high-speed engine, 150-K. W. generator, a multi-circuit series arc generator, 85-H. P. motor, switch board, etc., will be required. A. E. Winchester, General Superintendent.

Canandaigua, N. Y.—As a contract for lighting the streets has been made with the Electric Co., no municipal plant will be voted upon.

Springville, Utah.—The question of voting on bonds for an electric light and water works plant has been under consideration.

Selma, Ala.—The business men have been organizing a company to build an electric light plant.

Harrodsburg, Ky.—It was recently voted to issue $18,000 worth of bonds for a municipal electric light plant. Mayor J. H. Grimes.

Madisonville, Ky.—It was voted to issue $20,000 in bonds for municipal ownership of an electric light plant.

Vincennes, Ind.—A twenty-five year franchise was awarded the Vincennes Electric Light and Power Co.

Adrian, Mich.—The Council has been considering bonds for a municipal lighting plant.

Detroit, Mich.—Plans for a 10,000-H. P. electric plant have been prepared by Westinghouse, Church, Kerr & Co., and it will cost about $3,000,000.

St. Charles, Mich.—It was recently voted to issue bonds for an electric light plant.

Searcy, Ark.—An electric light and water works plant will be erected and contracts will be let December 1st. The estimated cost is $30,000. Sec'y E. Snipes, Board of Commissioners.

Minco, I. T.—An electric company has been organized with a capital of $4,000.

Davenport, Wash.—David Glasgow was awarded a twenty-five year franchise for an electric light and power plant.

Hinsdale, Mass.—A recent meeting of the town was held for the consideration of means for lighting the streets with electricity.

Holyoke, Mass.—The Holyoke Water Power Company has agreed to sell its gas plant to the city, for which $700,000 is to be paid.

Wayland, Mass.—The Weston Electric Light Company will build a gas plant here.

West Hartford, Conn.—It was recently voted to spend $200,000 on the lighting of certain streets. Charles C. Cooke is a member of the committee to consider the matter.

Boonville, N. Y.—It is reported that there is a movement to provide for a municipal lighting plant.

Princeton, N. J.—It is stated that engines and dynamos will be purchased for the new University gymnasium.

Swedesboro, N. J.—The Swedesboro Gas Company will build a gas plant. A. M. Worstall, President.

Allegheny, Pa.—It is stated that the Pittsburg Railways Company will construct a power house at Brunot's Island at a cost of $100,000.

Denver, Pa.—A new company has been formed to build an electric light plant. Dr. W. D. Fink.

Ephrata, Pa.—The borough recently paid $700,000 for the light plant of the Conestoga Valley Electric Light Company.

Rome, Ga.—The city railway will erect a new power house and extend its lines, at a cost of $250,000. President Seymour Cunningham, Washington, D. C.

(Continued on page 26.)

Vol. XIII., No. 6 December, 1902

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Table of Contents on Page 8

Index to Advertisers.

For Classified Business Directory, See Page 12.

TABLE OF CONTENTS

CLASSIFIED BUSINESS DIRECTORY

For Index to Advertisers, See Page 6.

AIR COMPRESSORS.
Allis-Chalmers Co.
Christensen Engineering Co.
Pneumatic Engineering Co.

AIR HOISTS.
Christensen Engineering Co.

AIR LIFT SYSTEMS.
Bacon Air Lift Co.
Pneumatic Engineering Co.

ALARMS, FIRE AND BURGLAR.
Western Electric Co.

ALARM SYSTEMS, FIRE AND POLICE.
Gamewell Fire Alarm Telgh. Co.

ARC LAMPS.
Western Electric Co.

ARTESIAN WELLS.
Bacon Air Lift Co.
Gregory, Elisha.

ASBESTOLITH.
The Asbestolith Co.

ASPHALT.
American Trading Co.
Boorman, T. Hugh.
Globe Asphalt Co.
Guelich, Otto E. C.
New York & Bermudez Co.
Warren Asphalt Paving Co.
Warren Brothers Co.

ASPHALT BLOCK.
International Pavement Co.
Lake Erie Asphalt Block Co.

ASPHALT FILLED COVERS.
Greger Mfg. Co.

ASPHALT PAVING.
Schillinger Bros. Co.
Warren Asphalt Paving Co.

ASPHALT PAVING PLANTS.
Warren Asphalt Paving Co.

ASPHALT ROLLERS.
Buffalo Pitts Steam Roller Wks.
Kelly Springfield Rd. Roller Co.
Oastler, W. C.
Port Huron Eng. & Thresher Co.
Scholl & Co., Julian.

ASPHALT TOOLS AND MACHINERY.
Scholl & Co., Julian.

AXLES, BALL BEARING.
Standard Anti-Fric'n Equip. Co.

BATTERIES.
Western Electric Co.

BITULITHIC PAVEMENT.
Central Bitulithic Paving Co.
Nashville Roofing & Paving Co.
Ohio Bituminous Macadam Co.
Warren Bituminous Paving Co.
Warren Brothers Co.

BOILER AND PIPE COVERINGS.
Keasbey, Robt. A.

BOILERS.
Allis-Chalmers Co.

BONDS, RAIL.
Wendell & MacDuffie.

BRAKES, AIR.
Christensen Engineering Co.

BRICK, PAVING, BUILDING AND SEWER.
Am. Enam. Brick & Tile Co.
Evens & Howard Co.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Texas & Pacific Coal Co.

BRIDGES.
Scherzer Rolling Lift Bridge Co.

BROOMS.
Oastler, W. C.

CABINETS, STEEL.
Art Metal Construction Co.

CANS.
Oastler, W. C.

CAR FENDERS.
Consolidated Car Fender Co.

CARRIERS, CAN AND BAG.
Oastler, W. C.

CASTINGS.
Christensen Engng. Co.
Greger Mfg. Co.
Modern Iron Works.
J. L. Mott Iron Works.
Permanent Mfg. Co.

CAR WHEELS.
Wendell & MacDuffie.

CEMENT.
Meacham & Wright.
Warren Brothers Co.

CEMENT MACHINERY.
Alexander, Bradley & Dunning
Allis-Chalmers Co.

CEMENT PAVING.
Schillinger Bros. Co.

CHEMICAL ENGINES.
Fire Extinguisher Mfg. Co.

CONCRETE STRUCTURAL WORK.
Ass'd Expanded Metal Cos.
Schillinger Bros. Co.
Warren Brothers Co.

CONDUITS.
American Vitrified Conduit Co.
Camp Co., H. B.
Gest, G. M.
Scranton Fire Brick and Conduit Co.
Standard Vitrified Conduit Co.

CONTRACTORS.
Gest, G. M.
Gregory, Elisha.
Schillinger Bros. Co.
Williams Co., The Geo. A.

COVERS, MANHOLE, CATCH BASIN AND INLET.
Greger Mfg. Co.
Modern Iron Works.
Permanent Mfg. Co.

CURBING.
Schillinger Bros. Co.

DREDGING.
Atlantic, Gulf & Pacific Co.

DUMP WAGONS. *(See Wagons.)*

DYNAMOS AND MOTORS.
Western Electric Co.

ELECTION BOOTHS.
American Steel House Co.

ELECTRICAL SUPPLIES.
Western Electric Co.
Geo. A. Williams Co.

ELECTRIC LAMPS AND FANS.
Western Electric Co.
Williams Co., The Geo. A.

ELECTRIC LIGHT POLES AND PILLARS.
J. L. Mott Iron Works.

ELEVATOR AIR CUSHIONS.
Ellithorpe Safety Air Cush. Co.

ELEVATORS.
Otis Elevator Co.

ENGINEERS, CIVIL, CONSULTING AND CONSTRUCTING.
Brennan, P. C.
Brown & Fleming.
City Wastes Disposal Co.
Darrach, Chas. G.
Fanning, J. T.
Guelich, Otto E. C.
Hague, Chas. A.
Hays, John W.
Hering, Rudolph, & Geo. W. Fuller.
Howard, J. W.
Iowa Engineering Co.
Knudson, A. A.
Kuichling, Emil.
McMurray, Eugene A.
Perkins, Frank C.
Rider, Jos. B.
Tingley Co., R. H.
Tyrrell, H. G.
Wise & Watson.

ENGINES, PUMPING, POWER AND LIGHTING.
Allis-Chalmers Co.

EXPANDED METAL LATHING.
Ass'd Expanded Metal Cos.
General Fireproofing Co.

FILING DEVICES.
Art Metal Construction Co.
Library Filing Cabinet Co.
Yawman & Erbe Mfg. Co.

FILTERS.
(See Water Filters.)

FIRE DEPT. STABLES.
J. L. Mott Iron Works.

FIRE DEPT. SUPPLIES.
American Fire Engine Co.
Chicago Fire Hose Co.
Fabric Fire Hose Co.
Fire Extinguisher Mfg. Co.
La France Fire Engine Co.
Seagrave Co., The.

FIRE EXTINGUISHERS.
Diggs Fire Extinguisher Co.
Fire Extinguisher Mfg. Co.
Little Giant Fire Ext. Co.

FIRE HOSE.
Chicago Fire Hose Co.
Eureka Fire Hose Co.
Fabric Fire Hose Co.

FLOORING, FIREPROOF.
The Asbestolith Co.
Schillinger Bros. Co.

FLUSH TANKS.
Pacific Flush Tank Co.

FOUNTAINS, ELECTRIC.
Electric Fount. Co. of America.

FOUNTAINS, PARK, STREET AND DRINKING.
J. L. Mott Iron Works.

FURNACES.
Hawley Down Draft Furn. Co.

GARBAGE FURNACES.
Decarie Mfg. Co.
Morse-Boulger Destructor Co.
Municipal Engineering Co.

GAS ENGINES.
Mietz & Weiss.

GATES.
J. L. Mott Iron Works.

GULLY CLEANERS.
Decarie Mfg. Co.

HOISTING ENGINES.
Allis-Chalmers Co.

INSPECTOR OF IRON AND STEEL.
Conard, W. R.

IRON FENCING AND RAILINGS.
Carpenter, F. E.

LADDERS.
Fire Extinguisher Mfg. Co.
Seagrave Co., The.

LANDSCAPE ARCHITECT.
Hawkes, Thomas.

LATHING METAL.
General Fireproofing Co.
Truss Metal Lath Co.

MACADAM PAVEMENTS, BITUMINOUS.
Central Bitulithic Paving Co.
Nashville Roofing & Paving Co.
Ohio Bituminous Macadam Co.
Warren Bituminous Paving Co.
Warren Brothers Co.

MAGNESIA SECTIONS.
Keasbey, Robert A.

MANHOLE COVERS.
Greger Mfg. Co.
Modern Iron Works.
J. L. Mott Iron Works.
Permanent Mfg. Co.

METAL FURNITURE.
Art Metal Construction Co.

METAL LATH.
General Fireproofing Co.
Truss Metal Lath Co.

METER TESTING APPARATUS.
Pittsburg Meter Co.

NOZZLES.
Fire Extinguisher Mfg. Co.

PARK CHAIRS AND SETTEES.
J. L. Mott Iron Works.

PAVING AND PAVING MATERIALS.
American Trading Co.
T. Hugh Boorman.
Central Bitulithic Paving Co.
Evens & Howard Brick Co.
Globe Asphalt Co.
Guelich, Otto E. C.
International Pavement Co.
Lake Erie Asphalt Block Co.
McAvoy Vitrified Brick Co.
Metropolitan Paving Brick Co.
Nashville Roofing & Paving Co.
New York & Bermudez Co.
Ohio Bituminous Macadam Co.
Schillinger Bros. Co.
Texas & Pacific Coal Co.
U. S. Wood Preserving Co.
Warren Asphalt Paving Co.
Warren Bituminous Paving Co.
Warren Bros. Co.

PIPE (SEWER).
Evens & Howard Co.
Monmouth Mining & Mfg. Co.
Pittsburg & Buffalo Co.

PLOWS.
Austin & Western Co., Ltd.
Oastler, W. C.

POSTS, LAMP, FOR ARC LIGHTING.
Western Electric Co.

PULVERIZERS.
Allis-Chalmers Co.
Kent Mill Co.

PUMPS AND PUMPING MACHINERY.
Allis-Chalmers Co.
Maslins.
Pneumatic Engineering Co.
Pulsometer Steam Pump Co.

RAILINGS, PARK AND BRIDGE.
J. L. Mott Iron Works.

RAILWAY SUPPLIES.
Wendell & MacDuffie.

ROAD MACHINERY.
Acme Road Machinery Co.
Austin & Western Co., Ltd.
Oastler, W. C.
Port Huron Eng. & Thresher Co.

ROAD ROLLERS.
Austin & Western Co., Ltd.
Buffalo Pitts Steam Roller Wks.
Kelly Springfield Rd. Roller Co.
Oastler, W. C.
Port Huron Eng. & Thresher Co.
Scholl & Co., Julian.

ROCK CRUSHERS.
Acme Road Machinery Co.
Allis-Chalmers Co.
Austin & Western Co., Ltd.
Kent Mill Co.
Wm. Yagle & Co., Ltd.

ROLLER BEARINGS.
Thorpe, S. B.—Moffett Roller Bearings.

ROOFING MATERIAL.
Boorman, T. Hugh.
New York & Bermudez Co.
Schillinger Bros. Co.
Warren Brothers Co.

RUBBER TIRES.
Standard Anti-Fric'n Equip. Co.

SCREENS, STONE AND SAND.
Allis-Chalmers Co.
Port Huron Eng. & Thresher Co.

SEWAGE DISPOSAL.
Cameron Septic Tank Co.
City Wastes Disposal Co.
Municipal Engineering Co.

SHUTTERS, STEEL.
Rolling Steel Shutter Works.

SMOKE PREVENTION.
Hawley Down Draft Furn. Co.

SNOW PLOWS AND SWEEPERS.
Wendell & MacDuffie.

STATUARY.
J. L. Mott Iron Works.

STEAM FIRE ENGINES.
American Fire Engine Co.
La France Fire Engine Co.

STREET CLEANERS.
Mienzies Street Cleaner Co.
Oastler, W. C.

STREET LAMPS.
Davis Acetylene Co.
Pennsylvania Globe Gas Lt. Co.
Welsbach Street Lighting Co.
Western Electric Co.

STREET SIGNS.
American Steel House Co.
J. L. Mott Iron Works.

STREET SPRINKLERS.
Austin & Western Co., Ltd.

STREET SWEEPERS.
Austin & Western Co., Ltd.
Hvass, Chas.
Kelly Springfield Rd. Roller Co.
Oastler, W. C.
Walker, H. B.

SWITCHBOARDS, FIRE ALARM AND POLICE TELEGRAPH.
Gamewell Fire Alarm Telgh. Co.

TELEPHONES.
Ericsson Telephone Co.

TILE.
Texas & Pacific Coal Co.

TREE GUARDS.
Carpenter, F. E.

TYPEWRITERS.
Smith-Premier Typewriter Co.

WAGONS AND CARTS.
Oastler, W. C.
Shadbolt Mfg. Co.
U. S. Sanitary Co.
Watson Wagon Co.

WATER FILTERS.
Automatic Water Purifying Co
N. Y. Continental Jewell Filtration Co.

WATER METERS.
Buffalo Meter Co.
Pittsburg Meter Co.
Standard Water Meter Co.

WATER STORAGE.
Acme Water Storage & Cons. Co.

WATER WORKS SUPPLIES.
Modern Iron Works.

WIRES AND CABLES.
Okonite Co.
Western Electric Co.

WOODEN PAVEMENTS.
U. S. Wood Preserving Co.

ZINCS, BATTERY.
Western Electric Co.

Villa Rica, Ga.—A company has decided to put in an electric light plant. Charles N. Griffin, President.

Pascagola, Miss.—The installation of an electric light plant and water works has been under consideration.

St. Louis, Mo.—The Council has passed a bill providing for a municipal lighting plant to cost about $140,000. The House of Delegates have the matter before them.

Kokomo, Ind.—The Kokomo Electric Light and Railway plants have been consolidated, and $100,000 will be spent on improvements. George Marott, Indianapolis.

Pana, Ill.—An injunction has been issued against erecting an electric light plant which was voted recently.

Milwaukee, Wis.—The Legislature will be asked to permit an appropriation of $200,000 from the water fund surplus so that in a few years the municipal lighting plant may be erected.

Brooklyn, Ia.—The Mason City Gas & Fuel Company offered to erect a gasoline lighting plant at about $5,000. The Council is considering the matter.

Marshalltown, Ia.—A special election may be held to vote on bonds for a municipal gas and electric plant.

St. Paul, Minn.—Bids are wanted December 2, for lighting the city for 1903 with gasoline, oil and electric lights. City Clerk Jensen.

Fargo, N. D.—Ex-Mayor J. A. Johnson has franchises for three electric light plants and will build them in the spring.

Linneus, Mo.—It was voted recently to erect an electric light plant.

Magnolia, Ark.—It is stated that Davis and Moore will build an electric light plant in the city.

Sweetwater, Tex.—It is stated that this place is to have electric lights.

Sedro-Wooley, Wash.—The Skagit Improvement Company will build a $45,000 light and water plant.

Tacoma, Wash.—The P. S. Improvement Company will develop the power on the Puyallup River. Stone and Webster, 93 Federal St., Boston, Mass.

Los Angeles, Cal.—The Edison Electric Light Company has been formed from several electric light and power plants. The capital is placed at $10,000,000.

Barre, Mass.—The development of Barre Falls for an electric plant will be undertaken by a syndicate, of which S. A. Morse is president.

East Orange, N. J.—The Hatfield Gas Co. has been incorporated at $25,000. B. M. Warner.

Marcus Hook, Pa.—The Suburban Gas Co. has permission to extend its mains.

Utica, N. Y.—The Cresset Electric Co. has been incorporated at $30,000. W. P. Campbell.

Carbondale, Pa.—The Carbondale Light, Heating and Power Co. has been incorporated and will build an electric light plant. C. S. Weston, Scranton.

Findlay, O.—The city will let a five or ten years' contract for electric lighting the streets. City Engineer Riegle.

Indianapolis, Ind.—The Indianapolis Gas Co. will put up a gas plant with the capacity of 2,000,000 cu. ft.

Hector, Minn.—Bids are wanted December 1st for $6,000 bonds for the purpose of building a gas plant. Village Recorder Ruesswig.

Lake Linden, Mich.—A committee of the Council has under consideration the installation of a municipal electric light and power plant.

No. Amherst, O.—Bids are wanted December 2d for the installation of an electric light plant to cost about $10,000. City Clerk Kaser.

Tell City, Ind.—The installation of a municipal electric plant has been under consideration for some time.

Jordan, Minn.—The Jordan Electric Light Co. has been incorporated and will build an electric light plant.

Little Rock, Ark.—The Council has been asked to issue a franchise for a heating plant to Oscar Davis.

Hot Springs, Ark.—Bids are wanted December 6th for furnishing electric lights to the city. City Engineer Hamblin.

Louisburg, Tenn.—The construction of an electric light plant is being urged by the citizens. The other plant was destroyed by a flood.

St. Louis, Mo.—The plans for a municipal electric light plant in the city hall have been approved by the Board of Pubic Improvements. It will cost $33,000.

Washington, Pa.—The Washington Electric Light and Power Company has been granted a franchise by the East Washington Council.

San Luis Obispo, Cal.—The San Luis gas plant has been sold to Hoyt and Miller, who will erect a new electric light and gas plant next spring.

Madisonville, Ky.—The municipal ownership of the electric plant was voted down November 4th. The electric plant of the Bailey Light and Water Co. will be rebuilt.

Golden Dale, Wash.—A franchise for lighting the city has been awarded to J. T. Moffett.

Gilroy, Cal.—It was voted not long ago to issue $15,000 bonds for the gas plant. An electric light plant will probably be added. City Clerk Hoover.

San Francisco, Cal.—The Pryamid Power Co. has been incorporated at $5,000,000. G. N. Sutherland.

Canton, O.—The Metropolitan Paving Brick Company writes that they are in the market for an electrical apparatus to operate about three-quarters of a mile of tram road, and they also intend to light two of their plants with electricity. W. E. Keplinger, President.

Flesherton, Ont.—The town is to be lighted by electricity and a by-law will soon be voted.

PUBLIC BUILDINGS

Boston, Mass.—Bids are wanted December 6th for a smithery building to cost $13,000. Chief Endicott, Bureau of Yards and Docks, Washington.

Norfolk, Va.—Plans for the Carnegie Library to cost $45,000 must be in December 1st.

Portsmouth, O.—Plans have been made for a $50,000 Carnegie Library. Richards, McCarty & Bulford, Architects, Columbus, O.

Emporia, Kans.—Bids are wanted December 3rd for building a post office. J. K. Taylor, Treasury Department, Washington, D. C.

Hamburg, Ark.—$50,000 has been appropriated for the Ashley County court house. Commissioner Ed. McCammon.

Corsicana, Tex.—The present court house has been condemned and the people will vote on $150,000 worth of bonds for a new structure

Spokane, Wash.—Mrs. L. S. Roberts and others may purchase a site for a library.

Pasadena, Cal.—The School Board will soon ask for plans for a high school to cost $80,000.

Wilkes-Barre, Pa.—The Council desires to issue $66,000 worth of bonds for building a police station and public baths.

Lexington, Ky.—At a recent election it was voted to issue $75,000 in bonds for three school buildings.

Montreal, Canada.—The Council has agreed to accept the offer of Mr. Carnegie of $150,000 for a library.

Jacksonville, Fla.—It was voted at a recent election to accept the $50,000 library offered by Mr. Carnegie.

New York, N. Y.—The plans of Hunt & Hunt were accepted for the 69th Regiment Armory, which is to cost $600,000.

Brooklyn, N. Y.—The Armory Board will receive plans on December 20th for the armory of the 2nd Battalion Naval Reserves. The cost is placed at $250,000.

Winfield, Kan.—The plans of H. M. Hadley, Topeka, were accepted for the Carnegie Library, to cost $15,000.

Winnsboro, La.—Plans for the $20,000 court house for Franklin County were prepared by Col. Stevens, of Alexandria.

Mississippi City, Miss.—The plans of Andrew J. Bryan & Co., Jackson, were accepted for the $40,000 court house of Harrison County.

Charlemont, Miss.—A committee has been appointed to supervise the building of a school. G. E. Bemis is a member.

Cedar Falls, Ia.—The State Normal School will have a $50,000 gymnasium in 1903. Board of Trustees.

Fresno, Cal.—Plans for a brick school to cost $40,000 were made by McDougall Brothers.

Scranton, Pa.—A swimming pool is to be erected by the City in Nay Aug Park at a cost of $20,000.

Binghamton, N. Y.—Plans for the Carnegie library, to cost $60,000, will be received January 15th. Secretary Deyo, Library Commission.

Sault Ste. Marie, Mich.—Plans for a Carnegie library have been prepared.

Decorah, Ia.—It was voted November 4th to issue bonds for a court house, which is to cost about $75,000.

Monticello, Ill.—On November 4th an issue of $100,000 bonds for a court house was voted. County Clerk Kagen.

Stevens Point, Wis.—Bids are wanted December 1st for erecting the Carnegie library. Chairman Buckingham, Bldg. Com.

Walcron, Ark.—A special tax has been voted for a $20,000 court house for Scott County

Lake Village, Ark.—Bids are wanted December 1st for erecting a jail. County Commissioners.

St. Francisville, La.—Bids are wanted December 3rd for erecting a court house for the parish of W. Feliciana.

Newport, R. I.—It was voted November 4th to issue $100,000 bonds for a high school.

Glenville, O.—It was voted on November 4th to issue bonds for a high school.

Dayton, Ky.—It was voted to issue $20,000 bonds for a school.

Jennings, La.—The citizens recently voted $30,000 school bonds.

Los Angeles, Cal.—$480,000 bonds for public schools and $200,000 bonds for a high school were voted not long ago.

Revere, Mass.—$12,000 were voted recently for a school building.

Boston, Mass.—A new bath house is to be constructed on Cabot street.

Woonsocket, R. I.—Plans for a state sanitarium are wanted December 8th by the Commissioners on State Sanitariums for Consumptives. Arthur W. Joyce, Clerk.

Cambridge, Md.—Bids are wanted soon for a hospital for the United Charities Hospital, to cost $50,000. George Archer, Central Savings Bank Building, Baltimore.

Tuscaloosa, Ala.—The County Commissioners have not yet selected a site for the proposed court house; the matter will be taken up again soon. M. C. Thomas, Secretary.

Gulfport, Miss.—A site for the new court house has been selected by the Board of Supervisors. The cost is placed at $50,000.

Cedar Falls, Ia.—A $50,000 gymnasium will be built by the Normal Board of Trustees.

Corsicana, Tex.—It was voted recently to issue $150,000 in bonds for a new school house.

Spokane, Wash.—Nothng has yet been done for the proposed library.

Whatcom, Wash.—The issue of $40,000 in bonds for a new school house will be taken up soon.

(Continued on page 28.)

Martinez, Cal.—It was voted to issue $161,000 in bonds for the new court house and jail.

Pasadena, Cal.—Plans for a new high school will be asked December 16th. Board of Education.

Norwood, Mass.—A contract for building the North school was let Forrest M. Douglass at $26,000.

Greenfield, Mass.—The rebuilding of the high school has been ordered. The cost is placed at $40,000.

Brockton, Mass.—Plans for a new high school have been selected. A $10,000 fire engine house will be erected. Mayor Battles.

Stockton, Cay.—All bids for the high school were rejected as too high. The plans will be changed and new bids will be asked. The cost will then be $100,000. Board of Education.

Rutland, Ill.—Reports state that plans were prepared for a $20,000 school.

Two Rivers, Wis.—It was voted recently to issue $35,000 in bonds for a new school.

Forest, O.—It was recently voted to issue $20,000 in bonds for a school. City Clerk H. E. Moore.

Racine, Wis.—It is stated that $80,000 in bonds for enlarging the schools will be issued by the Finance Committee.

Santa Cruz, Cal.—A site for the proposed $20,000 Carnegie library has been selected.

Yankton, S. D.—It was voted recently to issue $40,000 in bonds for a Court House for Yankton County.

Lincoln, Ill.—It was voted November 4th to raise $150,000 by taxes for a court house. County Clerk Beidler.

Manitowoc, Wis.—A resolution is before the Council providing for a court house for Manitowoc County, to cost $100,000.

Denison, Ia.—It was voted recently to erect a $75,000 court house for Crawford County.

Centerville, Ia.—It was voted recently to issue $75,000 in bonds for a court house for Appanoose County.

Scranton, Pa.—Bids are wanted December 19th for buildings for the almshouse at Hill Side Home. President Brookes, Board of Directors Poor District.

Bernardsville, N. J.—A site for the $20,000 library has been selected. Public Library Trustees.

La Porte, Ind.—It is reported that about 600 feet of fire hose is to be purchased.

The Badger Fire Extinguisher Company has been incorporated with a capital of $25,000. F. L. Button is interested.

Essex, Ia.—A movement to organize a volunteer fire company has been started by N. G. Miller.

Lexington, Ky.—The Police and Fire Committee have under consideration a resolution to advertise for 1,500 feet of fire hose.

Hudson, Ind.—It is reported that a new fire department has been organized here.

Auburn, Me.—The purchase of a combination chemical and hose wagon has been recommended by the fire commissioners.

Meriden, Conn.—It is probable that about $2,700 will be spent on a new fire alarm system.

Willimantic, Conn.—Reports state that 1,000 feet of new hose is badly needed.

Lansdowne, Md.—A new chemical fire engine is wanted. C. J. Hull.

West Bend, Wis.—The Council has been considering an ordinance calling for the purchase of a steam fire engine.

Colorado Springs, Col.—It is reported that a fire engine will be purchased and in addition $4,000 worth of hose. Fire and Police Board.

Greenville, Ky.—A chemical engine may be purchased for this place.

Cadillac, Mich.—The purchase of a combined hose and chemical wagon has been authorized. A paid department is to be formed and the best kind of apparatus will be installed. Fire Commissioners.

Linneus, Mo.—This place has voted to purchase a fire engine.

WATER WORKS

Walnutport, Pa.—States that the Blue River Water Supply Company has been incorporated with a capital of $5,000.

Altoona, Pa.—The water commissioners have recommended the purchase of a site for a new reservoir. It will probably be at Oakton.

Newcastle, Pa.—A recent report of the State Chemist declares that the water of this city is impure and not desirable for drinking purposes, and a committee of physicians has been appointed to suggest plans for a pure water supply. Dr. W. E. Zerner.

Northampton, Pa.—The Northampton Water Company has been incorporated with a capital of $1,000. Alvin F. Newhart is an incorporator.

Wilmington, Del.—Reports state that the Texas Rice Irrigation Company was incorporated by Albert Barnes with a capital of $500,000.

Meadville, Pa.—It is stated that the contracts for drilling test wells were obtained at 72 cents per foot.

Baltimore, Md.—At a recent election the proposition to issue $1,000,000 in bonds for increasing the water supply was carried. The Water Board will spend $350,000 of this amount for a new reservoir.

Hammonton, N. J.—At a recent election it was voted to issue $15,000 in bonds to complete the water works

Hillsville, Pa.—Reports state that water works are to be built in this place. Delos Ferrell.

Richmond, Va.—A committee has been appointed to ascertain the best way for constructing acetylene and coagulating basins at a cost of $350,000.

Bristol, Va.—Bids were received November 22d for $25,000 worth of bonds.

Detroit, Minn.—Estimates for a system of water works have been prepared.

Odell, Ill.—An ordinance was recently passed compelling the installation of meters before January.

Albia, Ia.—This place has voted to grant a franchise for a water system.

Goodhue, Minn.—Plans for a new water works system have been considered by the village council.

Duluth, Minn.—At a recent election it was voted to purchase the Western Duluth water plant, for which $140,000 worth of bonds were issued. City Clerk Cheadle.

West Milton, O.—Bids are wanted December 1st for constructing water works. Village Clerk John Coate.

St. Cloud, Minn.—The Water Works Company will either sell its plant to the city or put in a filtering plant, according to reports.

Dexter, Minn.—It is stated that bonds for a system of water works were voted.

Jewell Junction, Ia.—It was voted to issue $7,000 worth of bonds for water works.

Dundee, Ill.—Bids are wanted December 1st for a standpipe, engine and pump. William C. Albrecht, Clerk.

Wooster, O.—Estimates made by an engineer place the cost of a water supply at $100,000.

Newton, Ia.—This place desires to put in a water works system.

Lawrenceburg, Ky.—It was voted recently to issue $20,000 worth of bonds for water works and electric light plant.

Walla Walla, Wash.—The officials have been investigating the gravity water system of Seattle in the hope of installing a similar one for their city.

San Luis Potosi, Mexico.—This city is to have a complete system of water works, which will cost about $68,000.

Moline, Ill.—Mayor Wessel has come out in favor of mechanical filtration of water as opposed to the supply from artesian wells.

El Paso, Tex.—W. J. Dawis, of Los Angeles, Cal., was granted a franchise for water works.

Antioch, Cal.—A vote is to be taken on the issue of bonds for water works and sewers. City Clerk Wale.

Imperial, Cal.—The Imperial Water Company has been incorporated with a capital of $300,000. A. H. Heber.

Salt Lake City, Utah.—Plans for a reservoir in Parley's Canon will be prepared by City Engineer Kelsey. The cost is placed at $250,000.

Elmira, Ont.—This place has been considering the construction of $14,000 works. Dan. Ratz is the Reeve.

Athol, Mass.—It was recently voted to raise money for a new sewer system.

Hudson, Mass.—The question of sewer construction is in the hands of a committee of which George A. Tripp is the chairman.

Northampton, Mass.—The cost of extending the sewer system to the Connecticut river will be $100,000. L. M. Thatcher, Engineer of Sewer Commissioners.

Newark, N. J.—Plans for a sewer system at Badger avenue, have been made by City Engineer Adam. This and another proposed sewer will cost $125,000.

South Orange, N. J.—Bids are wanted December 2nd for a sewer system, including 13,700 feet of 10-inch pipe sewer; 105,780 feet of 8-inch; 348 man holes, etc. Robert S. Sinclair, President.

West Hoboken, N. J.—Plans for relief sewers will be drawn up. Street Committee.

Lancaster, Pa.—It was voted to issue $250,000 in bonds for extending the sewers. City Clerk Smetz.

Washington, D. C.—Bids are wanted December 20th by the District Commissioners for a sewage pumping station, conduits, etc.

Johnson City, Tenn.—Plans for a sewerage system have been provided for by the Council.

Portland, Me.—A committee has been appointed by Mayor Boothby to consider municipal ownership of water works.

Prophetstown, O.—The trustees are considering the construction of water works and sewers which were recently voted.

Chicago, Heights, Ill.—The Committee of Council has been investigating the improvement of the water works pumping plant, which will cost about $30,000. Alderman Dalton.

Enid, O. T.—It was recently voted to issue $15,000 in bonds for six miles of water mains.

Los Angeles, Cal.—The California Domestic Company will, on December 23rd, decide the issue of $230,000 in bonds for sinking wells, etc. Sec'y P. H. McPherrin.

Aylmer, Ontario.—The Town Council has been considering the purchase of water works.

Strathroy, Ontario.—The question of water works has been agitated and a vote on the question will probably be taken in January.

Keesville, N. Y.—A proposition from J. & J. Rogers Co., of Au Sable Forks, has been considered by the Village Board. The company wishes to provide the village with a new water supply and build a plant estimated to cost $30,000.

Bayonne, N. J.—On November 18th last bids were asked for $22,000 water bonds. City Clerk W. C. Hamilton.

No. Milwaukee, Wis.—Recently this village sold $30,000 worth of water bonds for the new system.

Harrison, O.—The village has under consideration the purchase of the water works and lighting plant from James Graft.

Gillett, Wis.—Bids are wanted December 29th for the construction of water works which will cost about $6,000. Village Clerk L. B. Studke.

(Continued on page 30.)

SEWERAGE

Wilkes-Barre, Pa.—The Council desires to issue $126,282 in bonds for building sewers.

South Bethlehem, Pa.—It is proposed to construct a sewer system to cost $100,000, the work to begin next year. R. K. Neumyer is the engineer in charge.

Philadelphia, Pa.—Appropriations for the coming year for sewers amount to $100,000 for the Cohocksink sewer; $250,000 for branches, and $500,000 for main sewers.

Bradley Beach, N. J.—It was voted recently to put in a sewer system to cost about $23,000.

Oneida, N. Y.—Plans for a sewer in Stone street have been prepared by City Engineer Vedder.

Lancaster, Pa.—It was voted recently to issue $250,000 worth of bonds to improve the sewer system.

Atlantic, Ia.—The Iowa Engineering Company, of Clinton, has submitted plans for a new sewerage system which will embrace thirteen miles of 20-inch to 8-inch pipe sewers, 31 flush tanks and 139 man holes. The cost is estimated at $42,516.

Dixon, Ill.—Bids are wanted December 7th for sewers in several streets. President F. A. Truman.

Bushnell, Ill.—The question of a bond issue for a sewer system has been considered.

Duluth, Minn.—The city engineer has been making estimates for a trunk sewer.

Rock Island, Ill.—Sewer extensions to cost $100,000 have been decided upon by the Council.

Clinton, Ia.—The City Council has been preparing plans and estimates for a complete sewerage system.

Peoria, Ill.—Ordinances have been introduced in the Council providing for three sewers to cost $150,000.

Naugatuck, Conn.—The Council has been discussing the question of sewers.

Batavia, N. Y.—At the November election the question of a sewerage system was voted down.

Canajoharie, N. Y.—Morrell Vrooman has been preparing plans for a sewer system.

Weehawken, N. J.—Bids for the new pumping station on Park avenue will be received some time in December. Geo. W. Bond, Township Engineer.

Perkasie, Pa.—A sewerage system to cost $40,000 will be built here.

Atlanta, Ga.—The sewerage system will be investigated by Rudolph Hering, of New York, and it is probable extensions will be made.

Jacksonville, Fla.—The Board of Public Works has been considering the question of sewerage.

Lake Charles, La.—Plans for a sewerage system have been made. John W. Maxcy, Houston, Texas.

Irvington, Ky.—The question of puting in a sewerage system has been considered.

Logansport, Ind.—It is probable that $175,000 will be expended on the sewerage system proposed. City Engineer Osmer.

Houghton, Mich.—F. W. Cappelen, Minneapolis, has prepared plans for a sewer sysytem.

Milwaukee, Wis.—The lowest bid for building sewers on three streets was $4.79 per foot. It was rejected because the Board of Public Works considered the work could be done for $3.00.

Pendleton, Cal.——An election will be held to issue bonds for $30,000 for a sewer system. Chairman Clopton, Sewer Committee.

Central Covington, Ky.—It is stated that the town voted $30,000 worth of bonds for sewerage.

Salem, Mass.—Plans for a sewerage system will be prepared.

Athens, Ala.—The Chamber of Commerce is investigating the question of a sewer system.

Collingwood, O.—A special election will decide the isue of bonds for sewers.

Bushnell, Ill.—The construction of a sewer system is asked in petition to the Council.

Pekin, Ill.—Petitions have been asked for the building of sewers on South Side.

Des Moines, Ia.—Bids are wanted December 2d for 246 feet of 12-inch clay pipe sewer in Cottage street, and 3,400 feet of the same size in Jefferson street. Board of Public Works.

Wichita, Kan.—A contract will be made with some firm for a plan of storm sewers for the whole city. City Engineer Harding.

Miles City, Mont.—A sewerage system will be constructed for Fort Keogh.

So. Joplin, Mo.—An agitation has been started for building sewers for this section of the city.

Oregon City, Ore.—Plans for the sewer in District No. 3 will be made by E. W. Paget.

Houston, Tex.—It is stated on local authority that the repairs of the filter beds of the sanitary sewer plant will cost several thousand dollars. Dr. W. M. Brumby, Health Officer.

Flagstaff, Ariz.—A vote will be taken December 8th on the issue of $9,500 bonds for the purchase and improvement of the sewer system. Town Clerk Quinlan.

Easton, Pa.—The Council has been considering an ordinance providing for an issue of $300,000 bonds for improving the sewers and streets.

Leetsdale, Pa.—The Leetsdale Bridge Co. has been incorporated at $10,000.

Crafton, Pa.—Bids are wanted December 2d for $2,500 bonds for improving the sewers, streets, etc. Borough Clerk W. O. Elliott.

Bond Hill, O.—It was voted on November 4th to issue $40,000 bonds for construction of a sewer system. Village Clerk A. J. Kipharb.

Des Moines, Ia.—Bids are wanted December 2d for 12-inch vitrified clay pipe sewer about 3,960 feet long. Board of Public Works.

Clinton, Ia.—The sewer system is being planned and work will commence in the spring. The cost is placed at $250,000. City Engineer Chas. P. Chase.

Peoria, Ill.—The construction of three sewer systems to cost $141,390 has been authorized by the Council.

Washington, Ia.—Additional sewers for this city have been planned.

Racine, Wis.—It was recently voted to issue $5,500 sewer bonds.

New Orleans, La.—The Executive Committee of the Sewerage and Water Board has recommended that a larger number of smaller contracts be made for performing the sewerage work and that new bids be asked about February 2d.

SEWAGE AND GARBAGE DISPOSAL

New York, N. Y.—The Decarie Manufacturing Company will build a garbage crematory at 142d street and Ryder avenue at a cost of $125,000.

Fort Getty, S C.—A garbage crematory was authorized for the U. S. Army Post.

Elwood, Ind.—The Mayor and officials have been visiting crematories so that recommendations may be made for improving their own.

Fort Grady, Mich.—A garbage crematory has been authorized for the Army Post.

Fresno, Cal.—Plans for a new crematory are being prepared by the City Engineer.

Toledo, O.—The plans of Engineer Torison for a sewage disposal plant were approved by the Sewer Committee.

Lake Charles, La.—Plans have been made for a sewage disposal plant. John W. Maxcy, Houston, Texas.

Fredonia, N. Y.—This place has been considering a sewage disposal plant.

New York, N. Y.—The bid for removing snow and ice in Manhattan Borough made by the Central Construction Company, at 39 cents per cubic yard, was rejected and new bids will be received.

Rochester, N. Y.—A new contract will have to be made for collecting the garbage in 1903, as the present one expires in January.

Kansas City, Mo.—Bids for the collecting and disposing of garbage will be received by City Physician Langsdale.

Wilkes-Barre, Pa.—The Council wishes to issue $27,000 in bonds for the purpose of erecting a crematory.

Allentown, Pa.—The Council has been considering an ordinance for the issue of $500,000 worth of bonds for a house sewerage system and disposal plant.

Atlantic, Ia.—The Iowa Engineering Company, of Clinton, has submitted plans for a sewage disposal tank to cost $500,000.

Philadelphia, Pa.—The Bureau of Street Cleaning has estimated its expenses for 1903 at $1,247,720. This was approved by the City Council.

Toronto, Ont.—The taxpayers will be asked next January to vote on $2,385,000 for a new sewage disposal system. Two plans have been suggested by the city engineer, and the voting will not commit the Council to either proposition. One scheme provides for a trunk sewer to carry unscreened sewage into a lake. This would cost $1,750,000 to build and $17,000 a year to operate, but is likely to contaminate the city's water supply. The other proposition is for septic tanks and filtration on a sewage farm. This would cost at first $2,385,000 and $75,000 a year to maintain.

St. Paul, Minn.—A resolution to spend $40,000 for street sprinkling was approved by the Committee on Streets.

Sandusky, O.—The Local Committee will arrange a garbage disposal plan at a cost of about $80,000. William F. Seitz, Jr., as at the head.

MISCELLANEOUS

Lexington, Ky.—At the recent election it was voted to issue $38,000 in bonds for the purchase of woodland park property to be used as a public park.

Montreal, Quebec.—The Road Committee of the Council wants to spend $2,000,000 on a large conduit for all the telephone and telegraph wires, etc., and also conduits to carry away the surplus sewage.

Linneus, Va.—It was voted recently to improve the city park.

Baltimore, Md.—Bids are wanted December 17th for dredging work in Curtis Bay, Md. Col. Peter C. Hains, U. S. Engineers.

Chicago, Ill.—Bids are wanted January 14th for dredging the main of Chicago River and one branch. Thomas A. Smythe, President.

Richmond, Va.—A special committee has been appointed to appear before the Finance Committee of the Council to urge a $30,000 appropriation for scows and a suction dredge for the improving of the James River.

San Diego, Cal.—It is stated that plans for beautifying 15,400 acres of city park will be made by Samuel Parsons, Jr., New York City.

CONTRACTS AWARDED

Greenburg, Pa.—Drake & Caldwell, Columbus, Ind., have the contract for the new court house, to cost $872,300.

Savannah, Ga.—The contract for an air compressor for the water works was let the Pneumatic Engineering Co., of New York, at $13,987.

Castana, Ia.—The National Construction Co., of South Bend, was awarded the contract for water works.

Whatcom, Wash.—The contract for laying the new water main was let to Charles E. Lind at $8,000.

Syracuse, N. Y.—The following bids for 15-inch pipe sewer were received: P. H. Lyons, $2,068; G. W. Dakin, $1,975; M. Marnell, $1,797; John Darin, $1,446; Martin Lavelle, $1,779.

Perth Amboy, N. J.—The contract for the North Amboy sewer was let Martin Hanson and C. C. Christensen.

(Continued on page 32.)

Philadelphia, Pa.—J. H. Wallace & Co. were awarded the contract for the Manayunk intercepting sewer.

Columbus, O.—Bids for 26,905 feet of 8 to 36-inch sewer were as follows: J. B. Sneetz & Co., Pittsburgh, $51,841; J. E. King, Tiffin, O., $56,608; Lee & Casey, Pittsburgh, $57,012;N. B. Abbott, $57,349; W. H. Luchtenberg & Co., $70,863; A. G. Pugh, $72,862.

Newton, N. J.—Contract was let McKernan & Bergen, Patterson, for macadamizing the county roads at $6,612. The contract for another section was let Augustus Munson Co. at $7,808.

Peabody, Mass.—A contract for constructing a 3,000,000 gallon reservoir was let to C. E. Trumbull & Co., of Boston, at $36,025.

Tonawanda, N. Y.—The Holly Manufacturing Co., Brockport, have a contract for a 800,000 gallon pumping engine at $26,500.

Westbrook, Minn.—W. D. Lovell, Des Moines, received the contract for cleaning the water works plant at $6,934. This includes 1,806 feet of 6-inch main and an 80-foot steel tower.

Buffalo, N. Y.—Bids for five sewers were received: John Mumm, $14,900; Dark & Company, $16,953; Miller, Franklin & Ritzman, $15,600; McKeown & Johnson, $1,555; Beaser Brothers, $17,112.

Springfield, Ill.—The contract for paving Allen street one mile, was awarded J. F. Bretz & Son at $1.38 per square yard.

Toledo, O.—Garrigan Brothers bid the lowest for paving Clark street with vitrified brick, and C. H. Burchinalls the lowest for asphalt block.

Redondo Beach, Cal.—Contracts for grading, etc., in the city were awarded Venable & Cleghorne, at $46,000.

Chism, Minn.—W. I. Grey & Co., Minneapolis, received the contract for installing machinery, boilers and electrical works in the electric light plant, for $8,253.

LaCrosse, Wis.—Contract for building the LaCrosse County court house was awarded to Peter Nelson, of La Crosse, at $121,847.

Castle Shannon, Pa.—Contract for erecting a school house was awarded to Snee Brothers, Knoxville, at $28,000.

Sparrows Point, Md.—Dan. Harding, Towson, has the contract for a school at $26,770.

South Orange, N. J.—The contract for building the Maplewood school was awarded to William Devogel, Passaic, at $21,260.

Syracuse, N. Y.—John W. Bustin received the contract for brick paving on East and West Colvin street, at $27,488.

Lynchburg, Va.—The contract for the electrical equipment of the Lynchburg Traction Company was let the General Electric Company, of Schenectady, at about $60,000.

Cleveland, O.—The contract for lighting the streets with vapor lamps in 1903, was let the Weston Street Lighting Co., at about $60,000.

Portland, Me.—A contract was awarded to Charles King, 7 Winter street, Boston, Mass., for the new buildings at Fort McKinley.

Nashville, Tenn.—George Moore & Sons have the contract for the new Carnegie Library at $85,650.

Peabody, Mass.—The contract for a 3,000,000 gallon reservoir was awarded C. E. Trumbull & Co., Boston.

Birmingham, Ala.—The Davis Construction Company, of Indianapolis, Ind., was awarded the contract for a new water works by the Birmingham Suburban Water Company.

Elyria, O.—The contract for a 2,000,000 gallon filter plant was awarded the N. Y. Continental Jewell Filtration Company.

Jewell, Ia.—The contract for a water works plant was awarded the National Construction Co., South Bend.

Castile, N. Y.—The General Electric Company, of Schenectady, N. Y., was awarded the contract for dynamos, etc., for the electric light plant.

Marlin, Tex.—The contract for erecting a school was awarded to H. Gailbraith, of Milford, at $23,200.

Houston, Tex.—A contract was let the Collins Manufacturing Company for an irrigation plant on the Rio Grande river. John W. Maxey is the engineer.

Miami, Ind.—Contracts for water works were let the Freeman Foundry and Machine Company, Joplin, Mo.

Schenectady, N. Y.—A contract for the Mill Creek sewer was let Kellam & Shopper at $4,566.

Milwaukee, Wis.—Bids for a sewage disposal plant at the County Poor Farm were: W. T. Werner, $14,495; Reichert Construction Co., Racine, Wis., $16,225; C. A. Lewis, $16,910; J. Cape & Son, $17,153.

Macon, Ga.—The City Council has contracted with the Macon Light and Railway Company to light the streets. Mayor Bridges Smith.

Erie, Pa.—The contract for city lighting was awarded the Edison Electric Light Company.

Savannah, Ga.—Contracts for dredging in this harbor and at Brunswick were awarded to P. Sanford Ross., Inc., Jersey City, N. J., at $490,000. Atlantic, Gulf and Pacific Company, of New York, for $559,390. Morris & Cummings Dredging Company, of New York, for the Brunswick work, at $77,000.

Indianapolis, Ind.—City Engineer Nelson has recommended to the Board of Public Works that subways be built in the alleys in the centre of the city before any more franchises are granted.

Duluth, Minn.—It is reported on local authority that all overhead wires in the business district will be placed underground within a year. The electrical companies have agreed to the electrical commission's plans, and will lay their conduits as soon as possible. Mayor Hugo.

New Britain, Conn.—The question of building a municipal lighting plant is again being considered by the Common Council.

Macon, Ga.—The Welsbach Street Lighting Company offered to install arc lights at $31.00 per year; the Macon Light and Railway Company offered 151 arcs, 2000-candle power, at $75.00 per year; incandescents at 15 cents per k. w. and power at 13½ cents per k. w.

Providence, R. I.—A contract was let Fred Smith for 3,800 feet of 12-inch, 455 feet of 8-inch sewer. Timothy F. Ryan has the contract for 480 feet of 26-inch brick sewer and 1,700 feet of 20-inch brick sewer.

Syracuse, N. Y.—Gleason & Keily have a contract for sewers in the First Ward, at about $38,000.

Roselle Park, N. J.—Bids for 5,900 feet of 15-inch pipe, 3,080 feet of 12-inch, 4,120 feet of 10-inch, 32,870 feet of 8-inch sewers, 140 man holes, and 27 flush tanks were as follows: David Harper, Newark, $55,946; Union Building & Construction Co., Passaic, $51,542; William McCloud & Company, Elizabeth, $58,362; Higginson & Shannon, Jersey City, $44,441; J. Roosevelt Shanley, Jersey City, $51,640.

Washington, D. C.—W. F. Brenizer Company, Washington, received the contract for low-area trunk sewer.

Fort McRee, Fla.—A contract was let Henry Monk for a storm sewer at $12,500.

Cincinnati, O.—Thomas P. Strack received the contract for the Jerome street sewer at $30,000. Contracts for other sewers were let W. H. Settle & Co., and McCarthy Brothers.

Chicago, Ill.—John H. McCarthy has the contract for a sewer in Monroe avenue at $17,000, and Nash Brothers have one for a sewer in Woodlawn avenue for $11,000.

Seattle, Wash.—J. A. Bailey was awarded the contract for an 8-inch sewer in East Alden street for $1,876.

Buffalo, N. Y.—The lowest bids for repairing Niagara street were: Barber Asphalt Company, for asphalt, $17,807; H. P. Burgard, for brick, $11,000, and for Medina stone, $23,500.

Schenectady, N. Y.—The Schenectady Contracting Company received the contract for grading Linden street.

Louisville, Ky.—A contract was awarded Lee Figg for paving with brick at $40,000.

Akron, O.—J. M. Davidson was awarded a paving contract at about $18,000.

Cincinnati, O.—A. J. Henkel & Bro. received the contract for improving two streets at about $13,000.

Toledo, O.—Bids for paving several streets were as follows: Harry Jennison, Medina stone on sand, $52,400; C. H. Burchinal, asphalt block on sand, about $45,400; Bodette & McMann, brick on concrete, $33,560.

Kansas City, Mo.—A contract for paving three streets was let the Parker Washington Company; for paving Lexington avenue, to the Gibson Company, and for Tracy street to the Asphalt Paving Company.

Everett, Wash.—A contract was let J. M. Collins for building the water front roadway.

San Francisco, Cal.—Flinn & Treacy have a contract for paving Lynch street.

Hammonton, N. J.—The contract for building two 500,000 gal. compound duplex steam pumps, two 100 H. P. boilers, etc., was awarded Henry A. Miller, Wilmington, Del., at $6,111.

Millard, Ia.—The contract for building water works was let the Des Moines Bridge and Iron Works Co. for $6,500.

Boston, Mass.—A contract was awarded James Dougherty for constructing the new Bennington Boulevard in East Boston, at $35,917.50.

Tifton, Ia.—A contract for erecting the Carnegie library was awarded M. M. Hall, of Cedar Rapids, at $11,924.

Silver Lake, N. Y.—A successful bid for a road containing about 8,285 square yards of 12-inch macadam and 3,115 square yards of 6-inch macadam was received from A. R. Gold, Tompkinsville, S. I., N. Y., at $14,500.

Syracuse, N. Y.—Bids for paving Warren and Willow streets were as follows: Empire Construction Co., Syracuse, $6,209 for asphalt; F. J. Baker, Syracuse, $7,160 for brick.

Vinton, Ia.—A contract for erecting the Carnegie library was awarded M. M. Hall, of Cedar Rapids, at $12,000.

Jerseyville, Ill.—Wolfe, Maupin & Curdie, Alton, Ill., has the contract for system of sewers 4,000 feet in length and 10 to 12 inches in diameter.

Kent, O.—The lowest bid for paving Water street with Metropolitan wire cut block was received from Mr. Davidson, of Akron, at $17,197. There were 9,208 sq. ft. of paving with curb, catch basins, etc.

Toledo, O.—H. G. Jennison, Toledo, was awarded the contract for repaving Front street—2,086 sq. yds.—with Medina block on sand at $52,429.12.

Lead, S. D.—The contract for paving Main and Mill streets with Galesburg brick at a five years' guarantee, was awarded Patrick McDonald, Duluth, Minn., at $70,000.

Akron, O.—The City Commissioners recently recommended that a contract be made with the Best Light Co., Canton, for building the city's municipal vapor light plant, to cost $7,500.

Boston, Mass.—A contract for erecting three buildings for the insane hospital was awarded Ernest T. Wilson, Natick, Mass., at $29,125.

Newark, N. J.—The Otis Elevator Co., New York, was awarded the contract for five passenger and one freight elevator in the new city hall, at about $23,500.

Philadelphia, Pa.—The contract was awarded Wm. J. Smith for the No. 21 Division School in 57th street, at $99,949.

Forrest, Ill.—The contract for a school was awarded R. Z. Gill at about $25,000.

Meadville, Pa.—The Dixon Garbage Furnace Co. received a contract for a 25-ton furnace for the city.

Baltimore, Md.—A contract was awarded the American Lighting Company for lighting the streets with naphtha lights for three years at $23.45 per lamp per year.

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